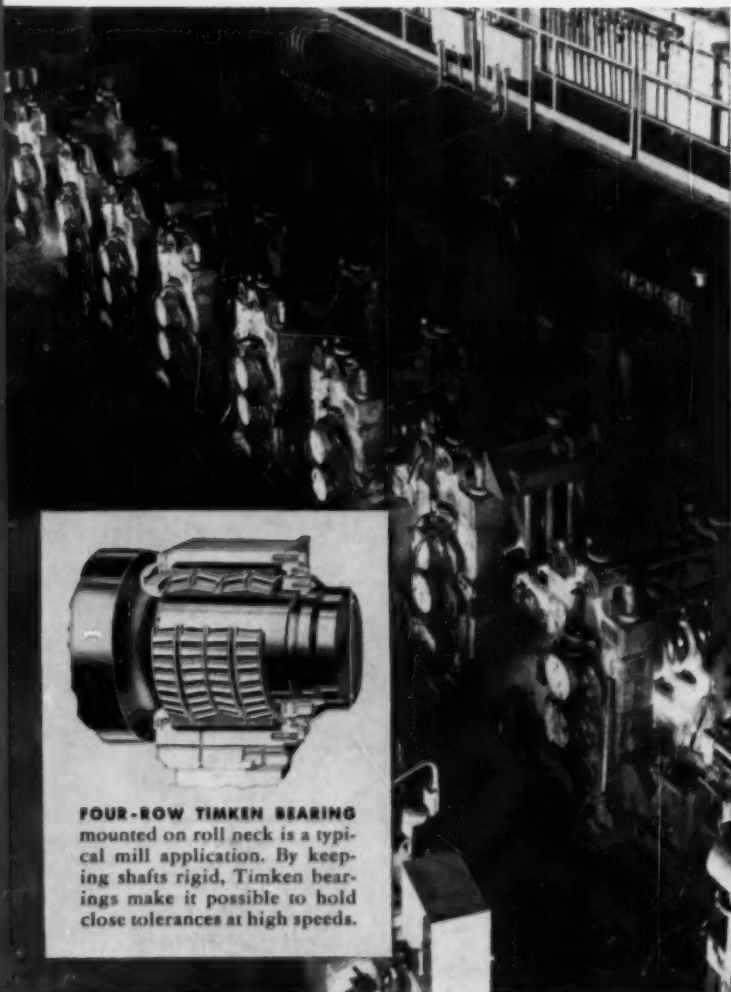


How 32 TIMKEN® bearings help high-speed rod mill set tonnage record, maintain accurate gage



FOUR-ROW TIMKEN BEARING mounted on roll neck is a typical mill application. By keeping shafts rigid, Timken bearings make it possible to hold close tolerances at high speeds.

THIS 11" rod mill at Jones & Laughlin's Aliquippa Works takes 2½" square billets 30 feet long and turns them into rods .218" in diameter at a rate up to 6,400 feet per minute. Output runs to a record 49.1 tons per hour.

To maintain minimum cost per ton of steel rolled, United Engineering equipped the 8 roughing stands with 32 Timken® tapered roller bearings on the roll necks, plus Timken bearings on the drive and pinion stands.

Timken bearings on this high-speed mill maintain alignment, because they can take both radial and thrust loads in any combination. Extra thrust devices aren't needed. And full line contact between rollers and races gives Timken bearings extra load-carrying capacity. Roll necks are held rigid; gage is maintained.

What's more with Timken bearings, mills can accelerate more rapidly because of lower starting resistance. At low speeds, mills can be adjusted quickly under full load without danger of scuffing the roll necks.

Timken bearings use economical grease lubrication—there's no need for large oil supply wells. Closures are more effective—Timken bearings keep housings and shafts concentric. The result is savings in time, maintenance costs and lubricant!

Improvements in roll neck bearing design and performance result from the Timken Company's experience and research in such fields as metallurgy and heat-treating. The Timken Company has also pioneered in testing roll neck bearing capacity requirements.

If you have an application for a roll neck bearing, the Timken Company engineers will be glad to help you. They have solved countless bearing problems throughout the steel industry. Write to: The Timken Roller Bearing Company, Canton 6, Ohio. Canadian plant: St. Thomas, Ont. Cable: "TIMROSCO".



This symbol on a product means
its bearings are the best.

TIMKEN

TRADE-MARK REG. U.S. PAT. OFF.

TAPERED ROLLER BEARINGS



NOT JUST A BALL NOT JUST A ROLLER THE TIMKEN TAPERED ROLLER
BEARING TAKES RADIAL AND THRUST LOADS OR ANY COMBINATION

**VULCAN,
THE ROMAN GOD OF FIRE**

When the ancient Romans heard thunder and saw lightning, they knew it was Vulcan, celestial smith of the gods, forging thunderbolts for Jupiter. Vulcan, patron of metalworkers, had his forge in the bowels of Mount Etna—and there are peasants in Sicily who still swear that Vulcan is at work when the volcano pours out lava.



Crafts and craftsmen through the ages

NUMBER SIX OF A SERIES

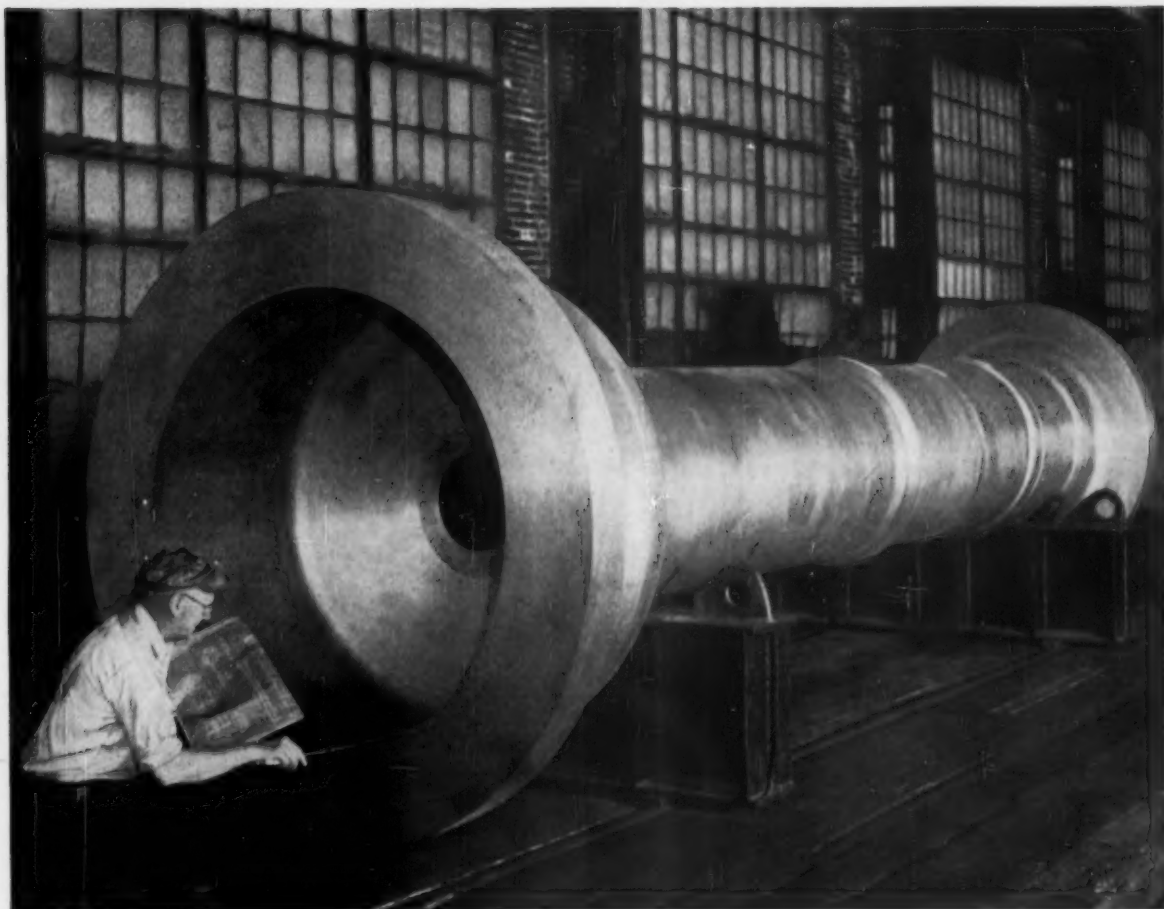
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Basic Refractories not only furnishes its customers with the finest refractories available, but also employs skilled craftsmen—men with practical steelmaking experience—to insure that the use of these products gives full value.

BASIC REFRACTORIES INCORPORATED CLEVELAND 15 OHIO

REFRACTORIES ENGINEERING AND SUPPLIES LTD — EXCLUSIVE CANADIAN AGENTS





It would do credit to a sculptor

This beautifully symmetrical shaft is the product of expert steelmakers, forging men, and machinists, working as a team. Of carbon-vanadium steel, it has the contours of a delicate vase or a sculptured column.

But don't let appearances deceive you. Despite its stylish lines the shaft is intended for heavy-duty work in a hydroelectric plant. It weighs 39 tons, and the diameter of the large flange is 78 in. The main body has an OD of $35\frac{1}{4}$ in. The hollow part of the "bell"—the end nearest you—had to be machined out, leaving a cavity 54 in. in diameter x 34 in. deep. That took some doing.

In fact, the whole job took some doing. It

required the most careful forging, treating, and machining—and before that, *planning*. It's the sort of thing that our engineers and shop men always look forward to.

We're showing it merely as a sample of what Bethlehem does in heavy forgings. But please don't get the impression that we only handle big jobs. If you require smaller pieces, we're all set up to make them for you. Even the smallest ones—tiny drop forgings that only weigh a pound or so.

BETHLEHEM STEEL COMPANY
BETHLEHEM, PA.

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BETHLEHEM STEEL



Vol. 87, No. 25, December 22, 1955

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NEWS DEVELOPMENTS

COPPER LOOKS TO PERU FOR NEW SOURCE — P. 27

Copper shortage is here for some time to come. In about five years, copper from one of the biggest developments will start flowing from Peru. New venture will turn up 10 million tons of copper. More than \$200 million will be spent before a pound of ore emerges from Southern Peru Copper Corp. undertaking. Town, docks, roads and other facilities must be built.

CONGRESS WILL SIT TIGHT ON FAST TAX — P. 29

Debate still goes on over fast tax write-offs. But there is little chance of any action in Congress either aiding or further curtailing program. Some argue that the law should be broadened so depreciation allowances take inflation into consideration. Critics say law will aggravate recessions and cost will be high.

IS BUSINESS PROTECTED BY LABOR LAWS? — P. 30

With 16 million workers now in one super union, industry looks at labor laws to see if it has adequate protection. Only Taft-Hartley and antitrust laws cover unions. Antitrust laws still retain original exemptions for labor activities. In practice, commercial restraint must be involved. Government officials and agencies are reluctant to act.

EARLY MARRIAGE TIGHTENS SECRETARY PINCH—P. 33

Government statistics show there are not enough girls to fill secretarial openings. Shortage stems from business expansion, educational factors and changing social patterns. Girls are getting married and becoming mothers at relatively early ages. Many businessmen claim the schools are neglecting fundamentals.

PUERTO RICO PLANS FOR MORE ALUMINUM — P. 35

After only six months in operation Puerto Rico's first aluminum extrusion mill is planning an expansion which will boost capacity by about 67 pct. Big factor is fact that local labor hired unskilled is reaching a point in their training where their productivity is starting to match mainland standards.

BOTH PARTIES MAP TAX REDUCTION PLANS — P. 49

Secret tax plans of both parties are said to include a higher dependant exemption and reduced rates for lower income groups. But corporations can look for little easing of present rates. Only hitch in tax slash plans would be a general business slump.

IN METALWORKING

ENGINEERING & PRODUCTION

ALLOY PLATING ADDS NEW PRODUCT APPEAL—P. 67
Co-deposition of metals has intrigued platers for a long time but it's been only recently that major roadblocks to commercial application were removed. Now, several alloys can be deposited, giving unique properties not obtainable by plating with single metals. Sales appeal, quality of product can be upgraded.

SO YOU'RE GOING TO BUY A PRESS? — P. 71
Planning to get a new press? Then you'll most likely set up to depreciate it over the next 10 or 15 years. And since you'll probably be running many jobs on it during that time, you'll need plenty of built-in versatility. Here's basic information to guide you in making wise buying decisions. There are tips on hydraulic and mechanical presses, rated capacities, speeds, adjustment and safety features, and lubrication.

ATTACHMENT ROLLS ACCURATE STUD THREADS—P. 74
A new type thread rolling attachment on 6-station automatic bar machines aids rocker arm valve stud production at Pontiac Motor Div. It assures accuracy of threads within 0.0005 in. Method saves handling, and thread roll life is excellent.

ATMOSPHERE CONTROLS UP HEAT TREAT WORK—P. 76
When Tulsa Winch Div. modernized its heat treat department it installed new batch-type furnaces with automatic atmosphere and temperature controls. The move has more than paid off in fewer rejects, better control, doubled production. Production averages 60,000 lb per month on a job lot basis. Volume is made up of 125 different parts weighing from 2 oz to 40 lb.

AUTOMATIC TINNING EASES REPAIR WORK — P. 79
Manual tinning of covers and plates was a bottleneck in a repair shop handling more than 100,000 gas meters annually. Now, with a special triple-operation machine, tinning progresses safely and automatically at 500 pieces an hour, 1000 pct higher than previously.

MARKETS & PRICES

HOW ONE COMPANY USES TRUCKS FOR SELLING—P. 34
Nickols Wire & Alumium Co., Davenport, Iowa, has two trucks calling on jobbers and retailers across the country. Idea is to show jobbers how to sell nails and other aluminum products; and to push sales at retail level. Company feels the trucks have proven their value over past year. Two more will be added.

AUSTRIA MOVES TO BOOST STEEL EXPORTS — P. 36
Heavy consumer demands at home are seriously hurting the nation's steel export trade. In a move to boost exports, the Austrian government has set up new export-import rulings. Net effect will push the country back into the world market and make it a strong competitor of the ECSC nations.

LOW WINTER SALES WORRY AUTOMAKERS — P. 44
Slump in winter sales has pessimists predicting bad things for 1956 auto sales. But November sales were ahead of same 1954 period despite slump. Even a 10 pct drop will mean more than 7 million cars, a good figure for any year. But cutbacks are occurring, although not of serious nature as yet.

FINANCIAL SQUEEZE HAMPERS MACHINE SHOPS—P. 55
Job shop volume is good but profit margins are narrow. Tough competition keeps prices down. On top of this, bill collections tend to lag. It all adds up to a shortage of funds needed for inventories and machines. A new financing plan is being offered as the answer to buying needs of hard-pressed shops.

STEEL OUTPUT FACES HOLIDAY LETDOWN — P. 97
As output for 1955 heads for an all-time high, consumers can look for a slight letdown in production during the holiday period. Demand continues to exceed output, and the scramble for steel forces many users into conversion and other premium sources. Imports of foreign steel are low, but prices are strong.

NEXT WEEK:

DOWN COME ALUMINUM CASTING COSTS

Many foundrymen would question the economics of producing large aluminum castings in permanent molds. But it is being done successfully and economically on both long and short run parts. Low-cost molds are precision cast, giving castings unusual accuracy, freedom from porosity, uniformity of finish.

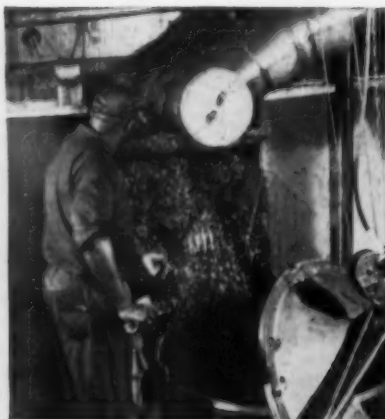
IS RUSSIA GAINING GROUND IN THE STEEL RACE?
Free world steelmaking fell off in the general 1954 lag. This year steel has come back strongly, both here and in free Europe. But has the pickup been enough to offset progress of Soviet bloc steelmaking? Next week's report tells exactly what happened in 1955 and where free world stands now in steel race.

**steel turnings
can be mighty
troublesome**

**until they're
reduced to this size**



Feeding steel turnings to the Jeffrey crusher as they come from the machines.



From the crusher, the reduced metal now goes to the centrifugal oil separator.



Jeffrey bucket elevator carries scrap to storage for delivery to trucks.

You haul only one-third the volume of scrap, and it's much easier to handle after you put your metal turnings through a Jeffrey crusher. Scrap brings a better price and it is practical to spin the turnings to salvage the cutting oil that clings to it.

You save on labor, get more money for your scrap, and reclaim valuable coolants. Thus you greatly increase the earning capacity of your salvage department.

Whether your problem is crushing turnings, pulverizing coal, shredding wood or grinding some other substance, there's Jeffrey know-how and equipment to help you. Bulletin 837-A describes it. The Jeffrey Manufacturing Company, Columbus 16, Ohio.



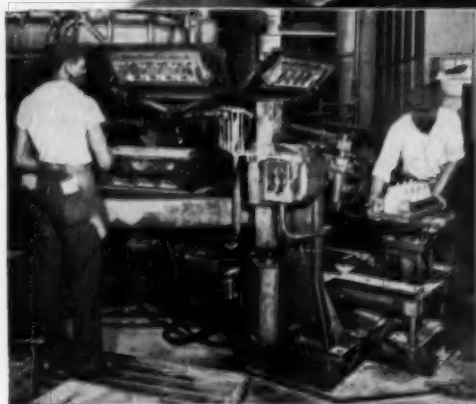
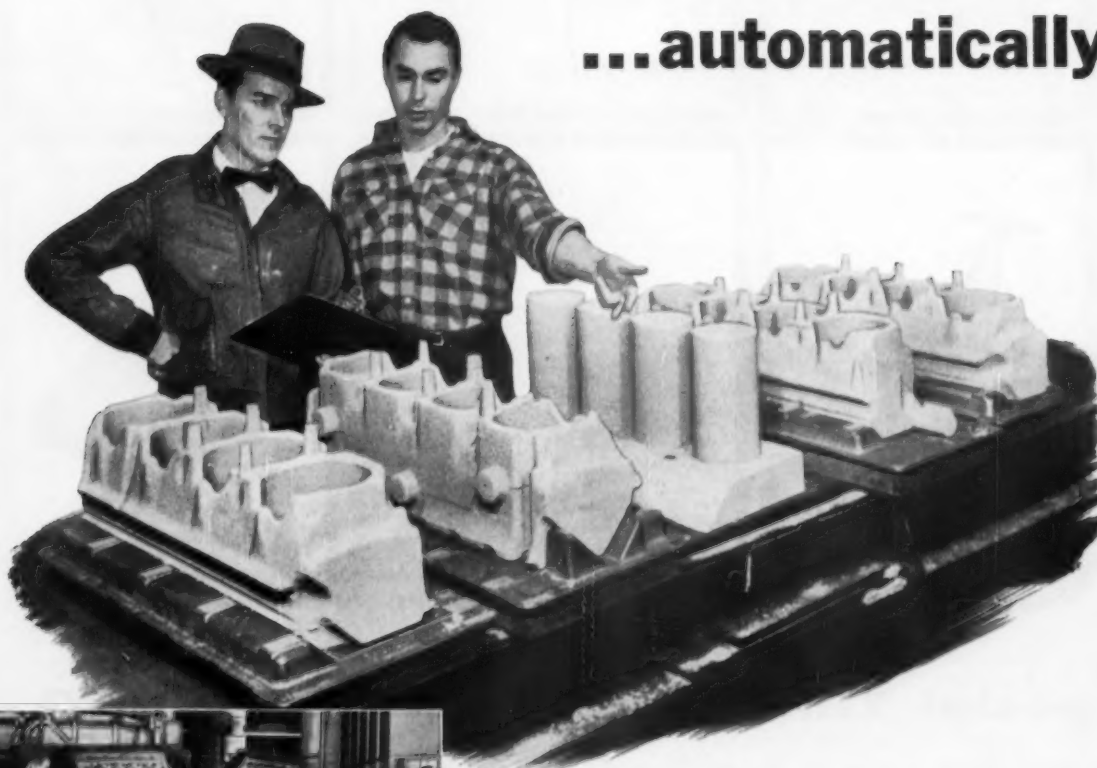
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...automatically



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Special Zinc-Coated ARMCO TUBING

May Improve Your Products, Too

A new kind of material is now going into the products you see here.

It is Armco ZINCORIP Tubing. Besides being modern looking, it gives these products the unbroken rust protection of a hot-dip zinc coating, along with the strength of welded tubing.

This welded tubing is made of Armco ZINCORIP, a special steel coated on both sides with zinc by a patented process. Even the welding flash is planed away on the outside, and a new zinc coating applied to form an almost invisible seam.

What's more, the special coating stays on when Armco ZINCORIP Tubing is bent or twisted into shape by the manufacturer. There are no zinc-bare spots where rust can get a quick start.

Armco ZINCORIP Tubing is made in outside diameters of 3/8-inch through 3 inches, with wall thicknesses of 20 gage through 12

gage. For information and prices, just fill out the coupon and mail it to us.

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We manufacture _____

Send me information on Armco ZINCORIP Tubing ☐

Quote me on:

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STATE: _____



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Indexed in the Industrial Arts Index
and the Engineering Index.



December 22, 1955

Editorial:

Program for Survival

♦ THIS IS THE TIME when the great religions turn our thoughts to matters of the heart—and of faith. It is prophetic that religions based on man's freedom and dignity have a way of outliving man-made tyrannies.

Jets, armies and nuclear bombs alone will not protect our free enterprise or our individual freedoms. We also need ideas, beliefs and faith in God and in ourselves.

Ideologies which rule out God now hold sway over more than 800 million peoples of the globe. Lies and deceit are the dictators' tools of acquisition and control. Semantics is their god.

The materialistic and military strength of the free countries will deter the Communists from starting a war—if they can get what they want "peacefully." This they are doing. It is time we made a long range plan; one that will benefit our great grandchildren, if not us. What can we do?

We can regain the fervor of the Crusades in our feeling for democracy. We can acquire the pride of the Arab, the discipline of the Indian and the patience of the Chinese. This we can do if we place a real value on our beliefs.

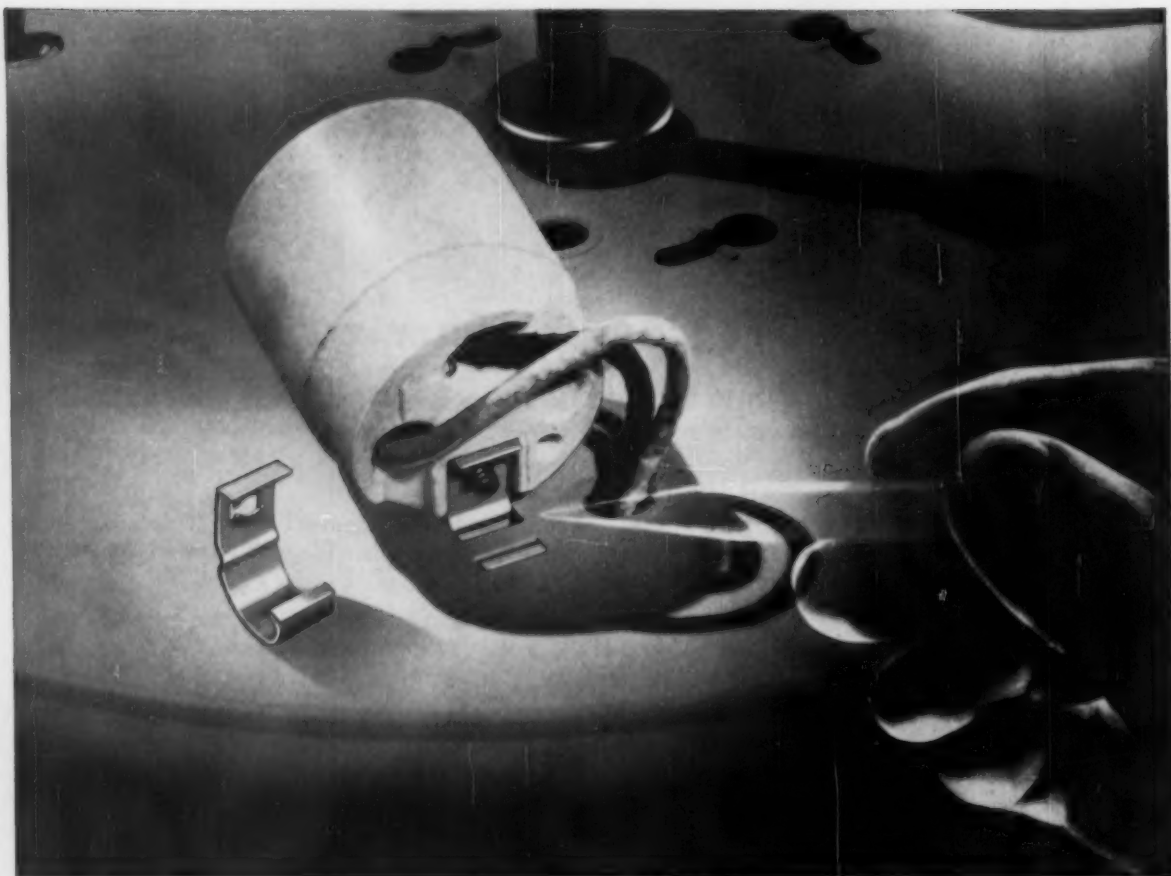
We can establish a great West Point of Diplomacy. Here we will send those who have the personality, the broad vision and the willingness to serve this country abroad. Here in this center will practical career men pass to the youngsters the fruits of their hard work. Here will be taught the thinking and culture of countries other than our own. Here will we get the nucleus of our foreign service organization.

We can by example practice our religion as God intended us to do. That will impress the Asiatic, whom we court, far more than speaking from a lofty intellectual perch.

We can lend government people to business so they will understand what makes free enterprise tick. We can expect top level business men to do a stint of government work so they will learn that government too has its side.

If we are to beat the Devil's advocates who rob the people of their freedom, we must have something better to offer. We can't offer it by the dollar sign and by guns alone. We must live, breathe and act the true spirit of survival.

Tom Campbell
EDITOR-IN-CHIEF



Engineered by Tinnerman...

THIS SPEED NUT® FASTENS WITH ONE MOTION, STAYS TIGHT FOR KEEPS... and saves money!

This SPEED NUT developed specially for ceiling lights produced by the Imperial Lighting Products Company, Latrobe, Pennsylvania, gained almost unbelievable savings of 80% in assembly time!

Once fastened to the socket assembly, it snaps into position quickly and easily by hand. No special tools or skills required. And this one-piece, spring-steel SPEED NUT does the job better than the three parts it replaces—a nut, screw and special tapped bracket. Additional savings are possible because there are fewer parts to purchase, stock and handle.

This is a typical example of SPEED NUTS engineered for special fastening applications. Tinnerman develops an average of 4 new SPEED NUTS every day for products of every description. And there are more than 8,000 existing variations to choose from.

A Tinnerman Fastening Analysis Survey can quickly tell you where SPEED NUT brand fasteners belong on your assembly line. Call in your Tinnerman representative soon for full information and write for our Fastening Analysis Service Bulletin No. 336.

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TINNERMAN

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 FASTEST THING IN FASTENINGS®



dear editor:

letters from readers

Depreciation Assist

Sir:

Thanks for the assist in your splendid editorial of December 8th on realistic depreciation. We are going right after that, and we appreciate your help very much, indeed. If a short period of recovery of investment is a good thing in the event of war in order to stimulate private investment, why isn't it a good thing now? I think the chief difficulty is that a great many people, including practically all Congressmen, do not realize that this is not a grant from the Federal Treasury. It merely postpones the payment of some taxes. At the end of the short period, if it is granted, the company pays more taxes because it has no further deductions to make for that piece of equipment. This is a simple point, but I think it is widely misunderstood. *Tell Berna, National Machine Tool Builders' Assoc., Cleveland, Ohio.*

Urgent Request

Sir:

Your November 24th issue contains a three-page article entitled, "STEEL: Expansion Wheels are Turning." Would it be possible for us to obtain three reprints of this extremely interesting article? The matter is rather urgent, since we want to mail them to our correspondents overseas. *A. A. Frank, Indussa Corp., New York, N. Y.*

Induction Heating

Sir:

I read your very interesting and informative article on Induction Heating in the November 10, 1955 issue. This article is excellent for quick reference on induction heating applications. It would be greatly appreciated if a copy of this article could be made available for my files. *K. Derdarian, Lockheed Aircraft Corp., Burbank, California.*

Color Glaze Process

Sir:

We noticed the article "Color Exterior: Field with a Future" in the November 17th issue. In this article there is mention of color exteriors on stainless steel. We would appreciate it if you could let us know who we could get in touch with to get the latest information on this development as we are very interested in any methods that can be used to color stainless steel. *W. C. Loop, DK Manufacturing Co., Chicago.*

This process was developed by the Princeton University School of Architecture for the Committee of Stainless Steel Producers, American Iron and Steel Institute, 350 Fifth Ave., New York 1. Since the process was developed for the stainless producers, your best bet would be to write the Committee at the above address.—Ed.

New Plating Process

Sir:

The feature story in the October 13th issue of IRON AGE, "New Chrome Plating Process Deposits Highly Ductile Coatings," has brought an unbelievable number of responses by letter, telegram and phone. Your editorial staff is to be complimented for the technical presentation, as most of the inquiries received are from research and engineering people.

As a result of these referrals, new applications for our processes are being considered for experimental work in our laboratories. We want you to know that we are most grateful and appreciative to IRON AGE and its staff for the splendid article. *Frank J. Rizzo, Tiarco Corp., Clark, N. J.*

Incentives

Sir:

Will you kindly send us six (6) reprints of the article—"Incentives: Aid to Indirect Workers"—which appeared in the November 24, 1955 issue on Page 45. *C. Grindrod, The Dole Valve Company, Chicago, Illinois.*

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selection

OF THE RIGHT
L&I REAMERS



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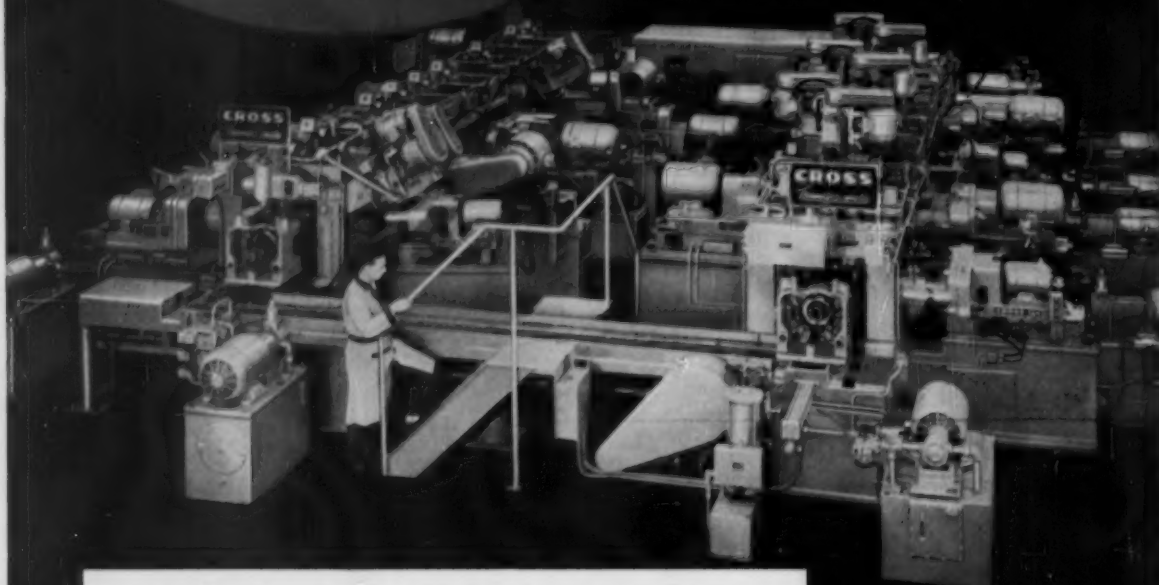
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Mills, Drills, Bores, Turns Differential Gear Carriers

Another Transfer-matic by Cross



- ★ Rough and semi-finish bores pinion bores and cross bores; rough and finish faces and turns pilot diameter of torque tube flange; mills faces of cross bore bosses; spotfaces flange mounting holes; drills, chamfers, reams and taps all other holes except flange holes.
- ★ 115 pieces per hour at 100% efficiency.
- ★ 73 operations: 8 milling, 8 boring, 2 crossfacing, 1 turning, 18 drilling, 10 spotfacing, 7 chamfering, 2 reaming, 9 tapping, 8 probing.
- ★ Complete interchangeability of all standard and special parts for easy maintenance.
- ★ Palletized work holding fixtures with hydraulically operated torque wrenches for clamping and unclamping parts.
- ★ Washing and drying unit for cleaning fixtures between last cutting station and loading station.
- ★ Other features: Construction to J.I.C. standards; hardened and ground ways; hydraulic feed and rapid traverse; automatic lubrication system.



Established 1898

THE **CROSS** CO.
DETROIT 7, MICHIGAN
Special MACHINE TOOLS

fatigue cracks

The Geneva Spirit

We don't like to say "we told you so" too often for fear you'll find out just how good we really are. So we space the "told you so" stories so that they appear only once a week.

This week we take you back to two editorials which appeared in July. In both cases things have turned out just about as predicted. Now that everybody realizes that the "Spirit of Geneva" was a mixture of 12 parts vodka to one part hokum with a guaranteed built-in hangover, we'd like you to recall "Are We Being Sucked in?" That was one of Tom Campbell's editorials which suggested just what the title implies. Score one.

... and while we refreshed our memory with that one we ran into another July editorial which predicted an increase in defense spending to a total of \$35 billion. This was going against the popular current as the word from Washington at that time was "cut-back." If you have been reading your papers lately, however, you will see \$35 billion in big print. Score two.

Puzzlers

The mule carried seven measures, the donkey five (Nov. 17 puzzler). No ifs, ands, buts or alibis. Winners: J. T. Lynch, Lehigh Structural Steel; Horst A. Paulat, Engelberg Huller Co.; George W. Frost, General Electric Co.; Theodore Zygmunt, U. S. Steel; L. B. Kramer, Wetherill Engineering Co.; Roy Darrell, Bell Aircraft Corp.; V. M. Johnston, Appalachian Coals, Inc.; Donald F. Stoneburner, Oak Ridge National Laboratory; L. Garfield Bayrer; Mildred F. Reed, International Harvester Co.; Ole Darcey; John J. Day, Lone Star Steel Co.; John E. Homer, Jr., Norman Chase, Dave Gromman and Jack McCallum of THE IRON AGE Puzzle Club; our ole pal Charlsie; Nels Johnson, Wireryte, Inc.; and C. W. McKinley.

by William M. Coffey



No More Cold Feet

... or "She's Throwing Away Her Mukluks!" If your secretary is threatening to wear Eskimo-style, fur-lined mukluks at her desk to keep her feet comfortably warm, get her instead a General Industrial foot warmer! (See picture above.)

Leonore (PENSACOLA 6-7720) Shephardson sent us the picture and she says that this foot warmer can be used by anyone in the office, store, factory or home to provide foot comfort during cold days. Leonore says they throw off a gentle warmth that keeps you healthy and comfortable. Leonore says they are available from General Industrial Co., 5750 N. Elston Avenue, Chicago, Ill. Mention my name.

New Puzzler

Two glasses contain the same amount. One glass contains pure water. The other contains pure wine. Now you take a spoonful of the wine and put it in the water. Then you take the same amount of water and wine and put it back in the glass of pure wine. Is there more wine in the water or more water in the wine? Or what? Thanks to R. A. Badt, an old hand at puzzlers.



GET THE GAS OUT...



The Kinney Mobile Vacuum Degasser brings the advantages of vacuum metallurgy into the foundry. Here's what it will do for you by removing gaseous inclusions from melts:

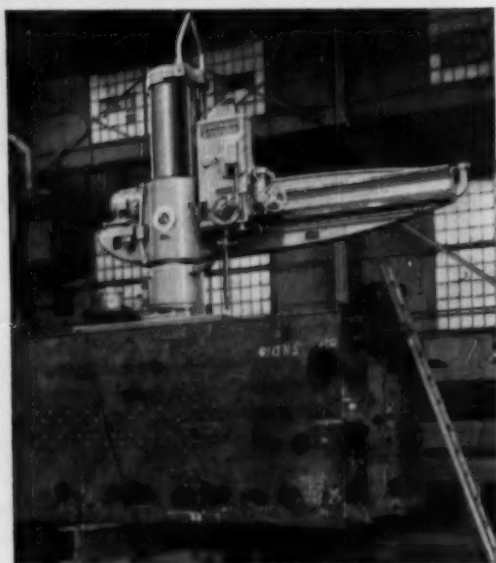
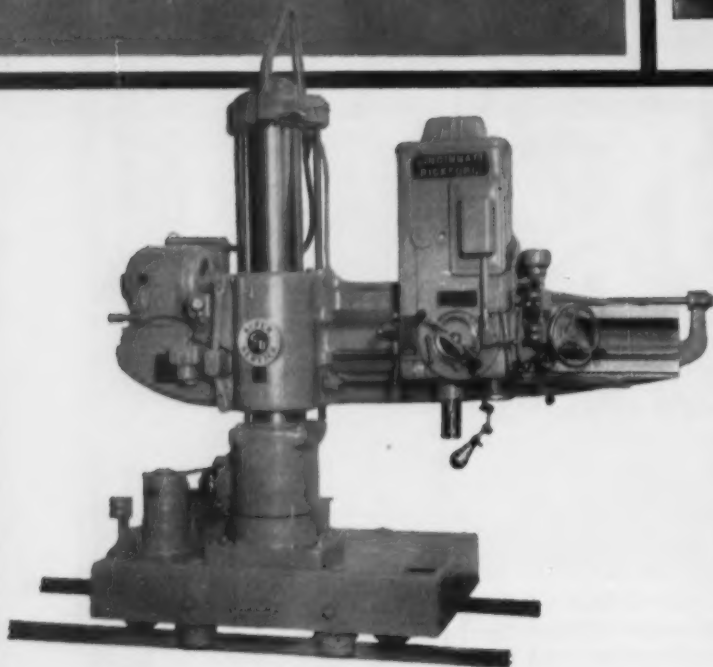
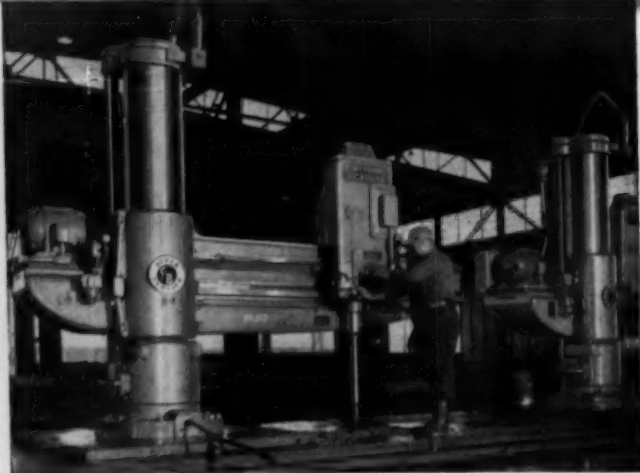
- Improve density and physical characteristics of castings . . . lower rejections, build profits.
- Eliminate chemical and gas flushing.
- Let you use lower grade metals.
- Eliminate costly impregnation processes.

The rugged design of the Kinney Mobile Vacuum Degasser assures any user of dependable, trouble-free service . . . and no skilled operator is needed. The vacuum chamber is proportioned and designed for easy melt control and observation. Rapid operation is achieved by a Kinney Model KDH-130 High Vacuum Pump which is gas ballasted to eliminate vapor problems.

Write today for Bulletin 402: Kinney Manufacturing Division, The New York Air Brake Company, 3634 Washington Street, Boston 30, Massachusetts.



MOVES
that save
you money

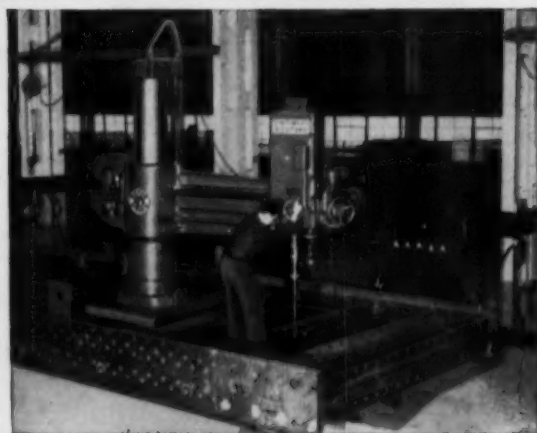


...on the large job!

These portable Cincinnati Bickford Super Service Radial Drills are effecting very large savings, up to 75% on work shown here. It is faster, more accurate and costs less to move the machine, instead of moving the work. Equipped with lifting bail, these machines are so perfectly proportioned and balanced that they need no clamping to work or floor. They do not tip or rise up while drilling.

Inquire about these portable machines—track type, sliding saddle on bed, or merely with stub base and lifting bail—they can save time and dollars for you.

Write for Bulletin R-29.



CINCINNATI
BICKFORD



RADIAL AND UPRIGHT DRILLING MACHINES

THE CINCINNATI BICKFORD TOOL CO.

Cincinnati 9, Ohio, U.S.A.

Subsidiary of GIDDINGS & LEWIS MACHINE TOOL CO. : Fond Du Lac, Wisconsin

dates to remember

JANUARY

INSTITUTE OF SCRAP IRON & STEEL, INC.—Annual convention, Jan. 3-6, Hotel Sherman, Chicago. Society headquarters, 1729 H St., N.W., Washington, D. C.

SOCIETY OF AUTOMOTIVE ENGINEERS, INC.—Annual meeting, Jan. 9-13, The Sheraton-Cadillac Hotel and Hotel Statler, Detroit. Society headquarters, 29 W. 39th St., New York.

AMERICAN ROAD BUILDERS' ASSN.—54th annual convention, Jan. 11-14, Miami Beach, Fla. Assn. headquarters, World Center Bldg., Wash. 6, D. C.

EXPOSITIONS

1954

ASTE—Industrial exposition, March 19-23, Chicago.

MATERIALS HANDLING SHOW, June 5-8, Cleveland.

STEEL SHIPPING CONTAINER INSTITUTE, INC.—Winter meeting, Jan. 18-19, Hampshire House, New York City. Society headquarters, 600 Fifth Ave., New York City.

COMPRESSED GAS ASSN., INC.—Annual meeting, Jan. 23-24, The Waldorf-Astoria, New York. Society headquarters, 11 W. 42nd St., New York.

INDUSTRIAL HEATING EQUIPMENT ASSN., INC.—Annual meeting, Jan. 23-24, LaSalle Hotel, Chicago. Assn. headquarters, 155 E. 44th St., New York.

TRUCK-TRAILER MANUFACTURERS ASSN.—15th annual convention, Jan. 23-25, Edgewater Gulf Hotel, Edgewater Park, Miss. Assn. headquarters, 1042 National Press Bldg., Washington, D. C.

PLANT MAINTENANCE & ENGINEERING SHOW—7th annual conference, Jan. 23-24, Convention Hall, Philadelphia. Society headquarters, Clapp & Pollock, Inc., 341 Madison Ave., New York.

NATIONAL RURAL ELECTRICAL CO-OPERATIVE ASSN.—14th annual meeting, Jan. 23-26, St. Louis, Mo. Assn. headquarters, 155 E. 44th St., New York City.

AMERICAN STANDARDS ASSN.—Gallard Seminar on industrial standardization, Jan. 23-27, New York City. Assn. headquarters, 70 E. 45th St., New York.

ENGINEERS JOINT COUNCIL—Second annual general assembly, Jan. 26-27, Hotel Statler, New York City. Society headquarters, 29 W. 39th St., New York.

AMERICAN INSTITUTE OF ELECTRICAL ENGINEERS—Winter general meeting, Jan. 30-Feb. 3, Hotel Statler, New York. Society headquarters, 36 W. 46th Street, New York City.

How would you SOLVE IT?



1 PRODUCTION PROBLEM: To speed production and cut costs of removing extra-thick weld seams from 2½ ton industrial boiler drums. Drums are made of 1" thick steel sections, welded together. Wickes Boiler Co. was using grinding wheels—found them slow, unsatisfactory.



2 SOLUTION: A 3M Representative suggested that this Saginaw, Michigan, manufacturer switch to the 3M Method using Three-M-ite Resin Bond belts installed on a swing grinder. Manufacturer found that each 3M belt removed these extra-heavy-duty welds faster, better.

3 RESULTS: An immediate production increase with much higher quality finishes. (Note: manufacturer experimented with a "Brand X" belt, found it averaged only 9 feet of weld per belt . . . 3M belt removed 30 feet!) A 3M Representative can help you solve your grinding and finishing problems, too. Call him today. There's no cost or obligation.



Made in U.S.A. by Minnesota Mining and Manufacturing Company. General Offices: St. Paul 6, Minn. In Canada: London, Ont., Can. Export: 122 E. 42nd St., New York City. Makers of "Scotch" Pressure-Sensitive Tapes, "Scotch" Brand Magnetic Tape, "3M" Adhesives, "Underseal" Rubberized Coating, "Scotchlite" Reflective Sheeting, "Safety-Walk" Non-Slip Surfacing.

WANT MORE INFORMATION?

Minnesota Mining and Mfg. Co.
Dept. DD-125, St. Paul 6, Minn.

- ☐ Send me free booklet: "Weld Grinding & Blending with 3M Abrasives"
- ☐ Please have 3M Representative call.

Name _____ Title _____

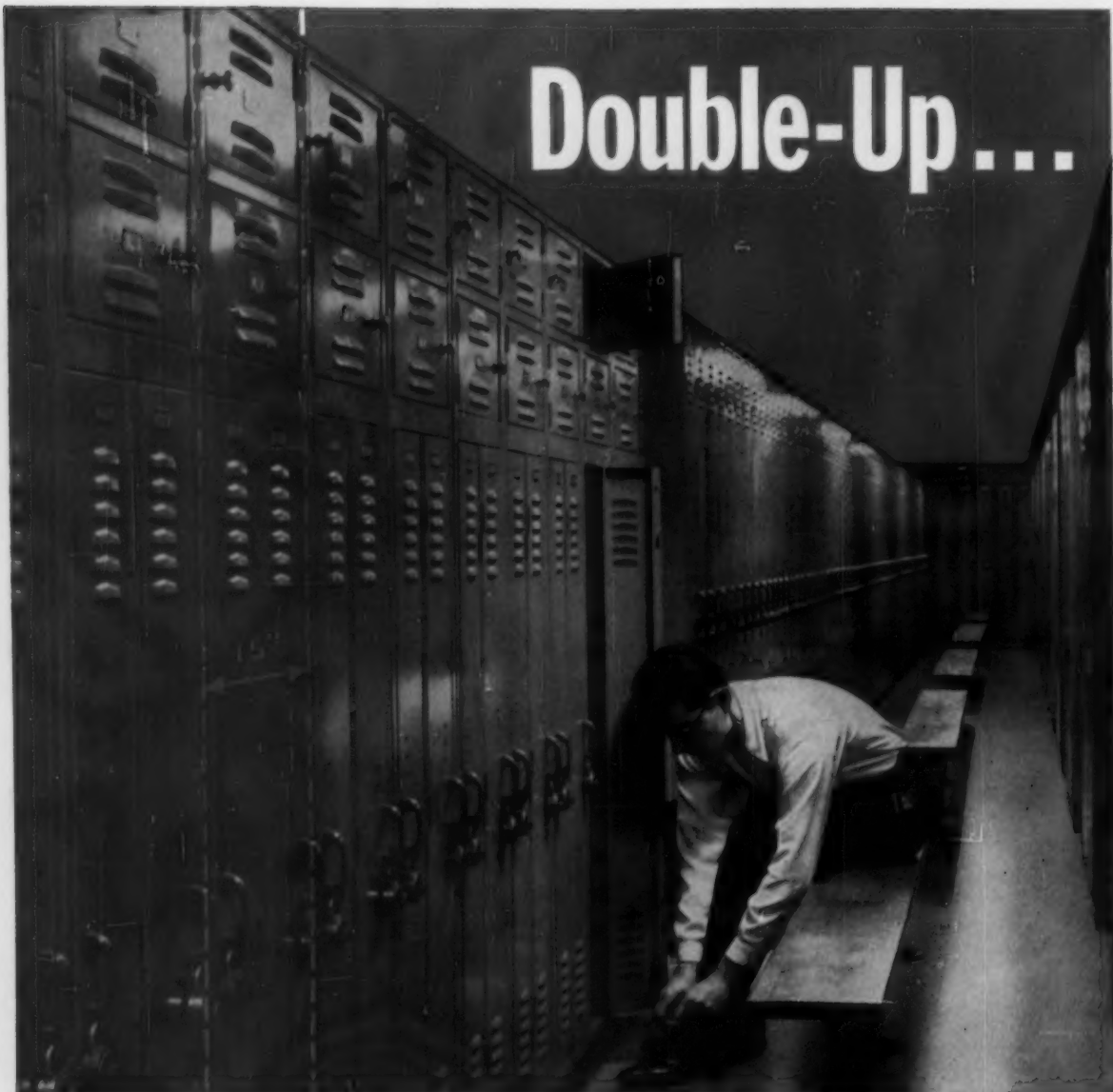
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Address _____

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My Distributor is _____





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3104 East 45th Street
Cleveland 27, Ohio



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- ☐ Lockers ☐ Tool Steel Warehouse Service
☐ Materials Handling Equipment
☐ Contract Facilities (Bulletins No. 793 and No. 908)

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Company _____

Address _____

City _____ Zone _____ State _____

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ADDITIONAL SPACE-SAVING ECONOMY is provided by Republic's complete line of Materials Handling Equipment. It fits in with whatever type of system you use. Boxes, Skid and Pallets keep materials moving, stack readily, save floor space. Pallet Racks permit palletizing of bulky, odd-lot, fragile materials. You load or unload from either side without restocking. Wedge-Lock Steel Shelving supports tremendous loads with no sway, sag or buckling. Mail the coupon for further information.

in comfort with REPUBLIC'S "SPACESAVER" LOCKERS

It's the ideal locker where space must be conserved—or utilized to obtain the maximum number of locker accommodations.

A standard 15" in width, the Republic "Space-saver" two-person locker, made by the Berger Division, provides separate compartments for two people in no more floor area than that required for one large individual single-tier locker. And yet the occupant has ample room to store his street wearing apparel and other personal effects.

Each compact locker is equipped with Berger's unique pre-locking door. The door operates with either a built-in lock or a padlock. It is designed to provide locked security the instant it is closed. When a padlock is used, for example, simply re-

lock it in the loop immediately after the door is opened. There's no need to rely on memory to safeguard belongings once the door is closed. There's no separate locking of the hat compartment to bother with, either. When closed, it locks simultaneously with the lower door by a foolproof innerlocking device.

Modern steel lockers that provide clean, safe storage for clothing and valuables can be a powerful aid to good employee relations. Investigate Berger's big line of quality lockers. Let Berger, the world's largest supplier of steel storage facilities, help you with your design, engineering or installation problems. Call your local Berger Sales Office. Or send coupon for descriptive literature.

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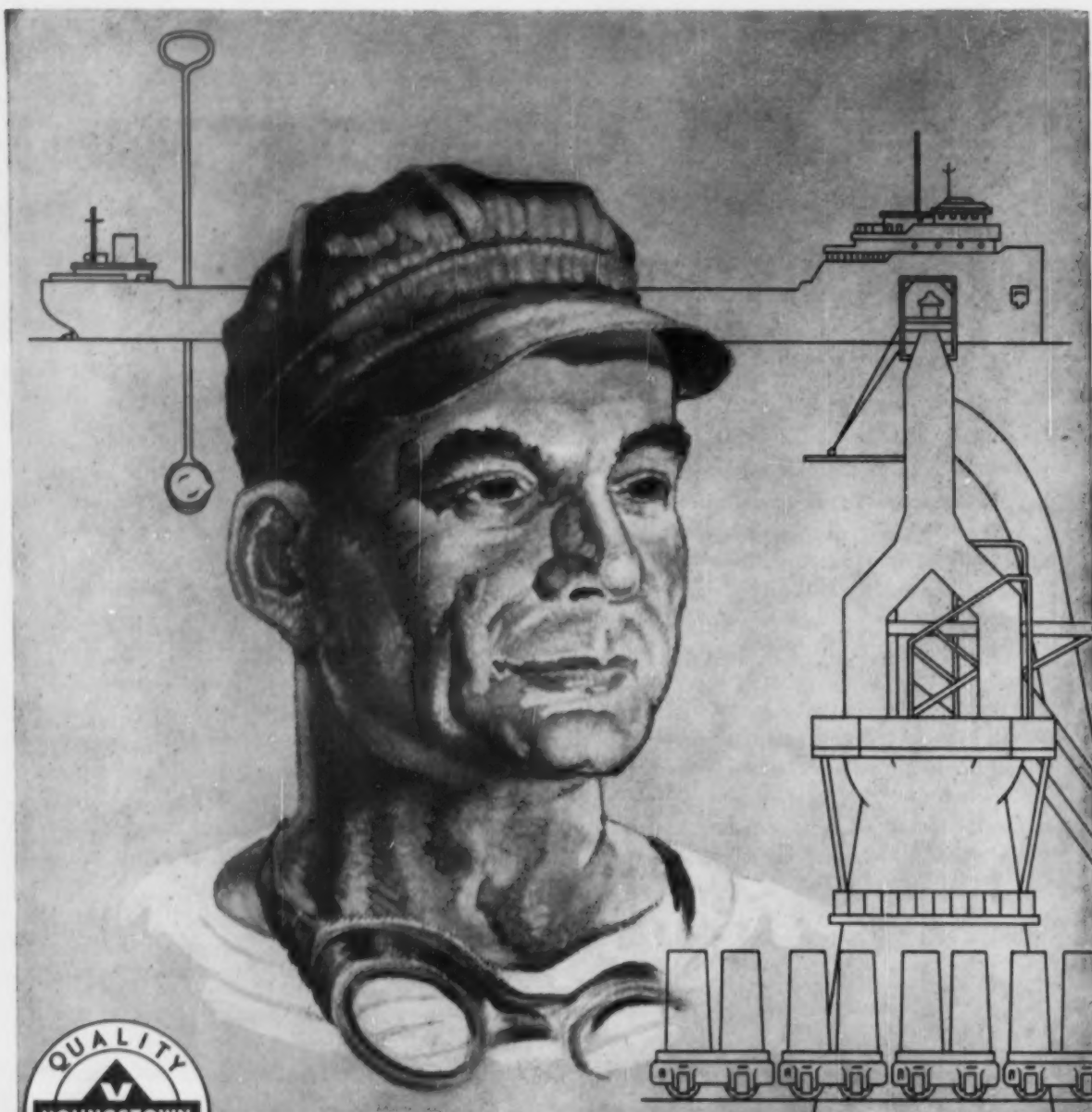


SAVE SPACE AND INVENTORY COSTS on steels for tools, like these milling cutters, by using Republic's Tool Steel Warehouse Service. Warehouses in Detroit and Cleveland carry complete stocks of tool steels, automotive die steels, precision-ground flat stock, cold-drawn shank steel. A phone call brings what you need in a hurry, whether it's one piece or a truckload. Questions on steels, dies, heat treating and machining are answered expertly and promptly by our tool steel metallurgists.



ELIMINATE PLANT OVERHEAD AND LARGE TOOLING INVESTMENTS by using the Berger Division's production facilities to fabricate your product. Berger's specialized service is complete, from engineering through fabrication, finishing, packing and shipping. A large stock of standard tools, dies and equipment is also available. As soon as a sketch or blueprint is finished, send to Berger with complete specifications. They'll advise promptly what can be done. Mail coupon for Bulletins 793 and 908.





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The Youngstown Sheet and Tube Company has established a reputation throughout the steel industry for quality and service that is jealously guarded by 27,000 employees who cooperate to produce and market a wide variety of steel products.

Pride in workmanship has been a hallmark of the Sheet and Tube employee since this company first started production at the turn of the century. Because we know reputations are won only in the

field of performance, there is a continuous effort to further improve. . . to further develop. . . the qualities of our products.

The apprentice at The Youngstown Sheet and Tube Company becomes immediately aware of the Company's high standards and is taught to guard and preserve them as he advances to more important and skilled work. Quality and service, which are featured in our trademark, are the standards by which all employees work.

THE YOUNGSTOWN SHEET AND TUBE COMPANY

Manufacturers of
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Production Pointers

from

GISHOLT



TIME-
SAVING
IDEAS



Highlighting the great, new Gisholt MASTERLINE Machines—emphasizing new strides in efficiency and in lowering unit costs on a variety of jobs.

SPEEDS UP WORM SHAFT OUTPUT

New Gisholt No. 12 Automatic with JETracer turns trick

Here's how to boost production and cut costs on steel traverse worm shafts, using the new Gisholt MASTERLINE No. 12 Automatic Production Lathe.

Special equipment includes a Gisholt JETracer Slide mounted on the front carriage, plus a new triangular shaped tool post—hydraulically operated and automatically indexed—carrying a roughing and finishing tool. This arrangement permits maximum tool clearance with a minimum of overhang. Machining is fast, with a spindle speed of 900 RPM and a 40 HP motor providing power for the heavy roughing cuts.

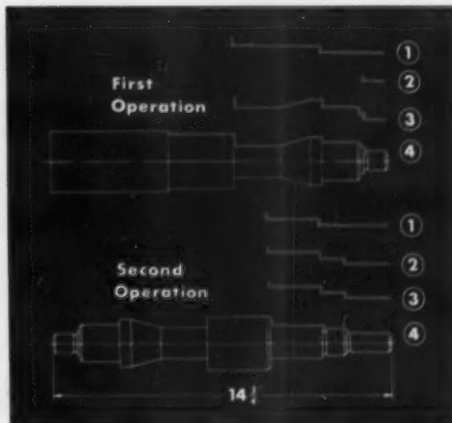
For the first operation, the rough bar stock is held between centers and driven by a work driver. As indicated in the drawing, one end of the part is rough and finish turned in four consecutive automatic passes. The tool post indexes automatically, presenting the finishing tool to the work for the final pass. At the same time, the grinding relief is formed from the rear independent slide. Floor-to-floor time: 3 minutes.

The second operation is equally easy and simple: the work driver jaws, templates and rear independent slide tools are changed—and the part is completed by four more automatic passes, with grinding reliefs formed from the rear independent slide during the finish turn. Floor-to-floor time: 2.80 minutes.

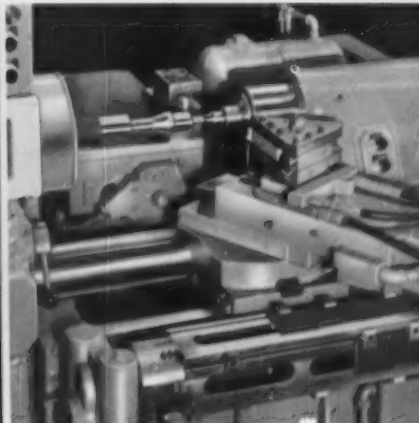
On this job, four consecutive automatic passes are made with four different templates to complete each operation.



New design refinements give Gisholt No. 12 MASTERLINE Automatic Production Lathe even greater capacity, versatility and ease of operation.



Special cam carrier indexes to present different template for each pass.



Closeup shows Gisholt JETracer Slide and automatic indexing tool post.

WITH THE GISHOLT MASTERLINE



**TIME-
SAVING
IDEAS**

START MODERNIZING NOW

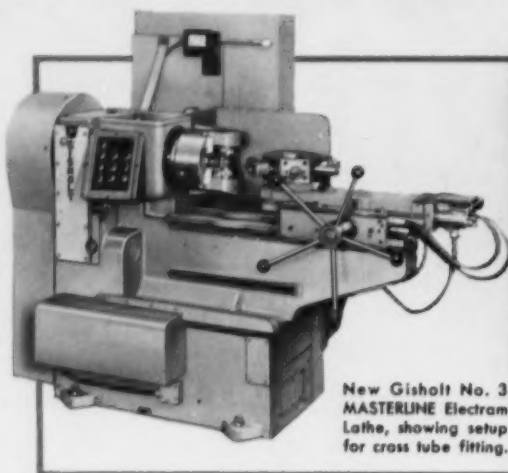
FOUR ENDS MACHINED IN SINGLE OPERATION

**New Electram
with pre-set controls
boosts production**

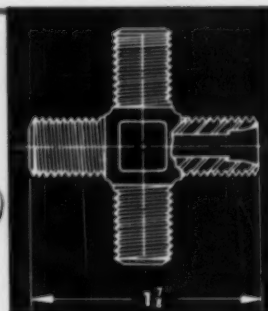
Here is a fast, positive, low-cost solution to handling parts requiring machining on two or more ends or sides—such as small to medium valves, tees, crosses, etc.

The machine is the new Gisholt MASTERLINE No. 3 Electram Lathe. The workpiece is a steel union cross tube fitting. All four ends are machined in a single chucking.

A Gisholt-Weatherhead Chuck is used to permit power indexing of the workpiece without stopping the spindle. Electrical controls at the rear of the turret ram are pre-set for each turret station and govern spindle speed, spindle reverse for tapping, spindle stop and single or double indexing of the hexagon turret.



New Gisholt No. 3 MASTERLINE Electram Lathe, showing setup for cross tube fitting.



Steel union cross tube fitting, showing surfaces machined on all four ends.

Hexagon turret tools face, chamfer, center, turn O.D., drill, form a 24-degree angle seat and a 15-degree angle bushing seat at all four ends. The workpiece is indexed in the chuck, so that tools on each hexagon turret station machine all four ends before indexing to the next turret station. To complete the part, all four

ends are threaded, with the spindle reversing each time to withdraw the die head. Floor-to-floor time? Just 1.50 minutes.

Through this well-planned setup, multiple operations are handled on each of four ends of union cross tube fittings—with high volume output at lowest cost.

JETracer SAVES ON TIME, TOOLING COSTS, INSPECTION

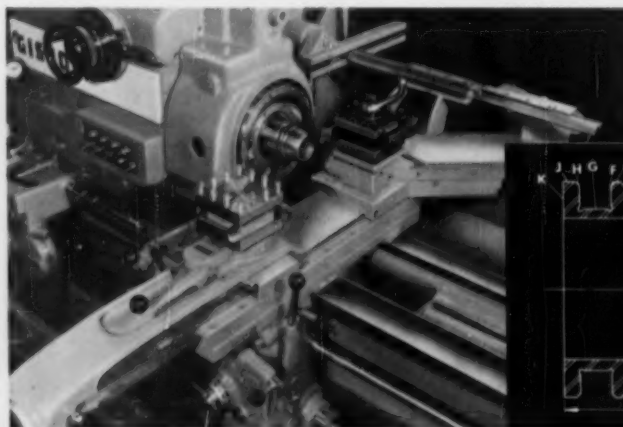
**Simple application on
Saddle Type Turret Lathe**

The problem: how to machine steel bar feed wedges from 4½" diameter stock in one fast operation.

The solution: a new Gisholt MASTERLINE 2L Saddle Type Turret Lathe, equipped with a JETracer and a 40 HP motor.

To feed the 4½" diameter bar stock through the 4½" spindle bore, an outside operated collet chuck is used. The JETracer, mounted on the rear of a bridge-type cross slide, provides an economical means of accurately machining the contoured O.D. of the wedge. Considerable time is saved, tooling costs are reduced and inspection is greatly simplified.

Machining begins with the rough bar stock fed through the collet, against a hexagon turret stop. Other hexagon turret tools start drill, drill and rough and finish bore A. A single

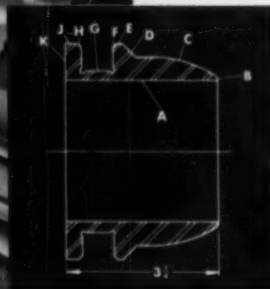


All surfaces handled in one fast operation. Close-up shows JETracer on rear of bridge-type cross slide.

cutter turns the stock O.D. in preparation for contour turning. Square turret tools rough and finish groove and chamfer F-G-H. The JETracer carries two tools (in an indexing-type square turret) which rough and finish generate B-C-D-E-J in two quick passes. The bar feed wedge is

cut off at K from the front of the cross slide, and the job is finished. F.t.f. time is 8.50 minutes.

Time is saved and inspection is simplified on this job through a most modern machine and smart tooling.



LOOK AHEAD... KEEP AHEAD... WITH GISHOLT



TIME-
SAVING
IDEAS

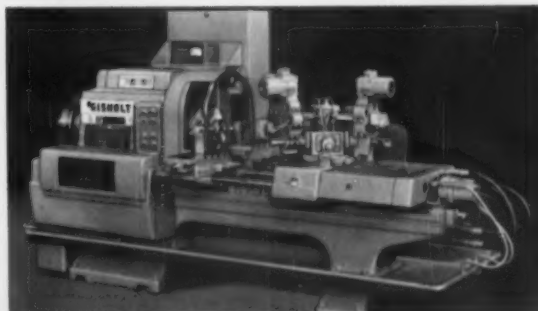
NEW FASTERMATIC CUTS SETUP TIME 50%

Simple toggle switches govern all machine functions

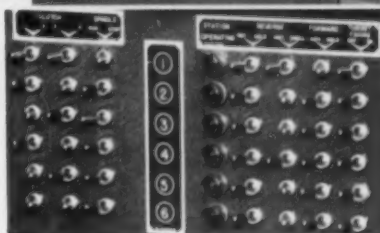
This new Gisholt MASTERLINE 2F Fastermatic Automatic Turret Lathe makes quick work of steel gear blank forgings. The secret is a new, electrically-controlled setup panel which simplifies and shortens set-up.

GEAR A—Operation 1: Hexagon turret fully tooled for both operations. Stations 1, 2, 4 and 5 machine A-D-G-H. Cross slide tools machine B-C-E-F. F.t.f. time: 5.05 minutes. **Operation 2:** Change-over—one hour. Cross slide tools and chuck jaws changed, cross slides set to operate with stations 3 and 6. Stations 1, 2, 4 and 5 by-passed. Stations 3 and 6 machine M-J. Cross slide tools machine K-L-N-P. F.t.f. time: 1.50 minutes.

GEAR B—Operation 1: Change-over—1½ hours. Adjust tools on stations 3, 4, 5 and 6 and change on stations 1 and 2 and on cross slides. Chuck jaws and spindle speeds changed and cross slides set to operate with stations 1 and 4. Stations 3 and 6 by-passed. Stations 1, 2, 4 and 5 machine A-F-G. Cross slide tools machine B-C-D-E. F.t.f. time: 5.75 minutes. **Operation 2:** Change-over—



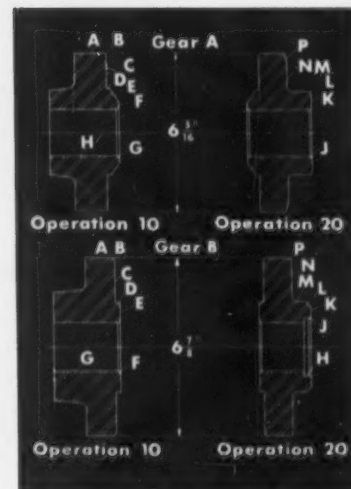
New Gisholt MASTERLINE Automatic Turret Lathe, designed to cut setup time 50%.



Close-up shows toggle switch control panel on new Gisholt Fastermatic.

1 hour. Cross slide tools and chuck jaws changed, cross slides set to operate with stations 3 and 6. Stations 1, 2, 4 and 5 by-passed. Stations 3 and 6 machine M-H-J. Cross slide tools machine K-L-N-P. F.t.f. time: 1.39 minutes.

Initial setup of the new Fastermatic is fast—simple toggle switches are set to govern all machine functions. On re-runs, a master reference card is used to further setup time.



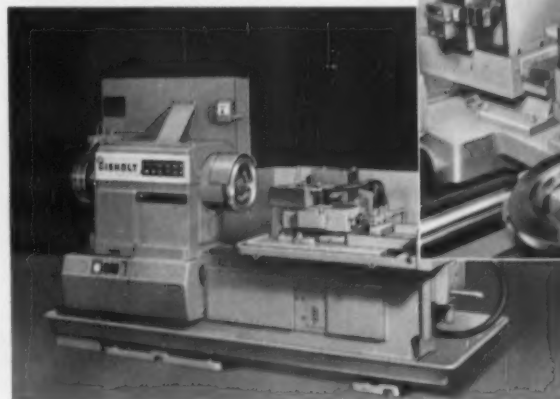
BEVEL GEAR FORGINGS IN 1.75 MINUTES F.T.F. TIME

New MASTERLINE Simplimatic does low-cost job

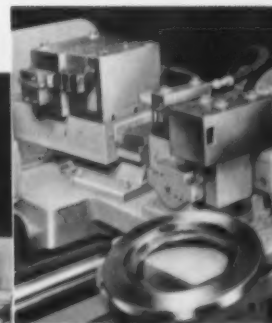
Tough steel bevel gear forgings are a pushover on the new Gisholt Simplimatic Automatic Lathe.

Here's the operation: the part is centralized in the previously machined bore and chucked on the web in a draw-back clamp fixture. The platen table traverses forward, carrying slides and tools into position. The rear slide is set at the proper angle to machine the bevel face C. As the lead tool—held in a separate auxiliary slide—begins to feed, it is cammed to plunge into the face to roughing depth. Then, as slide movement continues, the lead tool feeds across with other rear slide tools following, to machine bevel face C and

New Gisholt MASTERLINE Simplimatic Automatic Lathe, designed for high-speed automatic machining operations.



radius B. At the same time, front slide tools turn A and form radius D. F.t.f. time: 1.75 minutes.



Tooling setup for bevel gear job. Both slides have adjustable taps to speed tool setting. Rear slide has swivel base to simplify angular adjustment.

Fully automatic cycle of Simplimatic lets one man do two-man job; reduces f.t.f. time; cuts machining costs.





TIME-
SAVING
IDEAS

HIGH-SPEED OUTPUT ON VALVE TAPPETS WITH NEW GISHOLT SUPERFINISHER

Fully automatic handling speeds Superfinishing

Here's how cast iron valve tappets are handled automatically on the new Gisholt MASTERLINE No. 81 High Production Superfinisher.

Cup-shaped stones are used, rotating off-center to generate a .005" crown on top of each tappet.

These parts are Superfinished from a flat ground surface down to 5 micro inches RMS or less. As each part is completed, a work transfer device with a left and right pickup arm is actuated. The left arm removes a rough part from a feeder conveyor, while the right arm receives the Superfinished part ejected from the spindle. Next, the transfer indexes so that the left arm is over the spindle and the right arm above a discharge conveyor. An ejector assembly pushes the rough



Superfinished tappet with .005 inch crowned top.

Note cup-shaped stone over piece; pickup arms; ejector assembly and chamfer attachment.

workpiece into the spindle—the finished part onto the discharge conveyor. The transfer indexes to neutral, permitting the stone to engage the work. After Superfinishing, the stone retracts; a chamfering attachment



New Gisholt MASTERLINE No. 81 High Production Superfinisher.

operates, and the above cycle repeats. Floor-to-floor time is only 16 seconds per piece.

Superfinishing gives valve tappets longer life; automatic handling cuts costs.

Improved Gisholt Type 1SV1 DYNETRIC Balancing Machine setup for clutch and pressure plate assemblies (inset).



Write for free copy of Form 1165-A, the new Gisholt Type "S" Balancing Catalog.

No. 11-1255
643

LOCATES, MEASURES, CORRECTS, INSPECTS IN SINGLE HANDLING

Gisholt 1SV1 DYNETRIC Balancer handles 90 parts an hour

This is an interesting example of how the 1SV1 Balancer cuts costs, by minimizing the motions demanded of the operator.

Here, clutch and pressure plate assemblies are rotated as the operator observes angle and amount of unbalance in the same visual field. One unit on the amount meter represents $\frac{1}{32}$ " drill depth of a $\frac{1}{16}$ " diameter drill at the radius of correction. A simple scale on the drill press assures drilling to depth indicated on the meter. Angular location is read on a dial under a stroboscopic lamp.

To correct for unbalance, the operator stops the spindle, positions the part for correction at the observed angle, and lowers the drill. A chip removal tube comes down with the drill and removes chips as they are formed. A thrust device supports the work. After correction, the part is again rotated to assure balance within tolerance. The 90 parts an hour are handled at 80% efficiency.

Equipping a standard balancing machine with simple attachments assures maximum production with minimum effort.

THE GISHOLT ROUND TABLE represents the collective experience of specialists in the machining, surface-finishing and balancing of round and partly round parts. Your problems are welcomed here.



GISHOLT

MACHINE COMPANY

Madison 10, Wisconsin

TURRET LATHES • AUTOMATIC LATHES • SUPERFINISHERS • BALANCERS • SPECIAL MACHINES

CHRISTMAS



GREETINGS

UNITED ENGINEERING AND FOUNDRY COMPANY

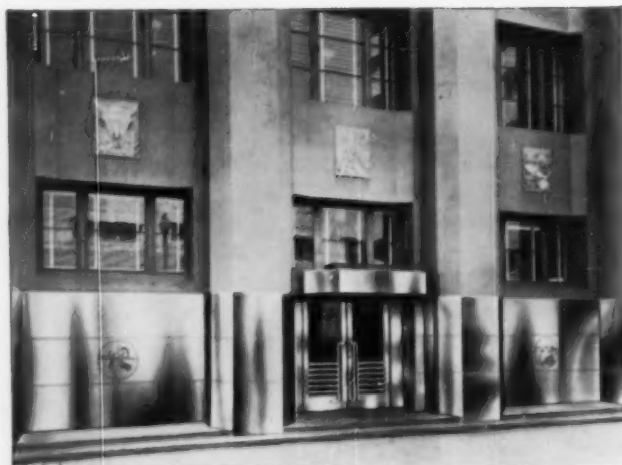
Pittsburgh, Pa.

Wherever people give a building
a beating

outside

or

inside



That's the place to use **STAINLESS STEEL**

"INFO" for Architects and Builders

- 1 "Al Structural Stainless Steels"—12 pages on stainless grades, properties, forms, finishes, standard "specs," uses and advantages.
- 2 "Stainless Steels for Store Fronts and Building Entrances"—40 pages of valuable data on examples and details. AIA File No. 26D.
- 3 "Stainless Steel Curtain Walls"—A 24-page progress report on methods. AIA File No. 15-H-1.

Write for Details

Address Dept. A-721

You have to design for maximum attractiveness in those areas of buildings which have most traffic—such as building fronts, marquees, entrances, lobby details, railings, etc. Yet those same places are exactly the locations where you need maximum utility, too.

What's the *best* material to use? Just remember that stainless steel—and *only* stainless steel—gives you the nearest-to-perfect combination of satiny beauty and rugged toughness. No other material is as good-looking and at the same time as

strong, hard-surfaced and resistant to rust or discoloration. No other material requires as little maintenance, cleans as easily and lasts as long.

In short, whether you're considering Allegheny Metal for just the "hard-wear" spots or for an entire curtain-wall design, keep this fact in mind: *no other material costs as little over the long pull as stainless steel.*

Let us give you any information or technical assistance you may require.

Allegheny Ludlum Steel Corporation,
Oliver Bldg., Pittsburgh 22, Pa.

Make it **BETTER**-and **LONGER LASTING**

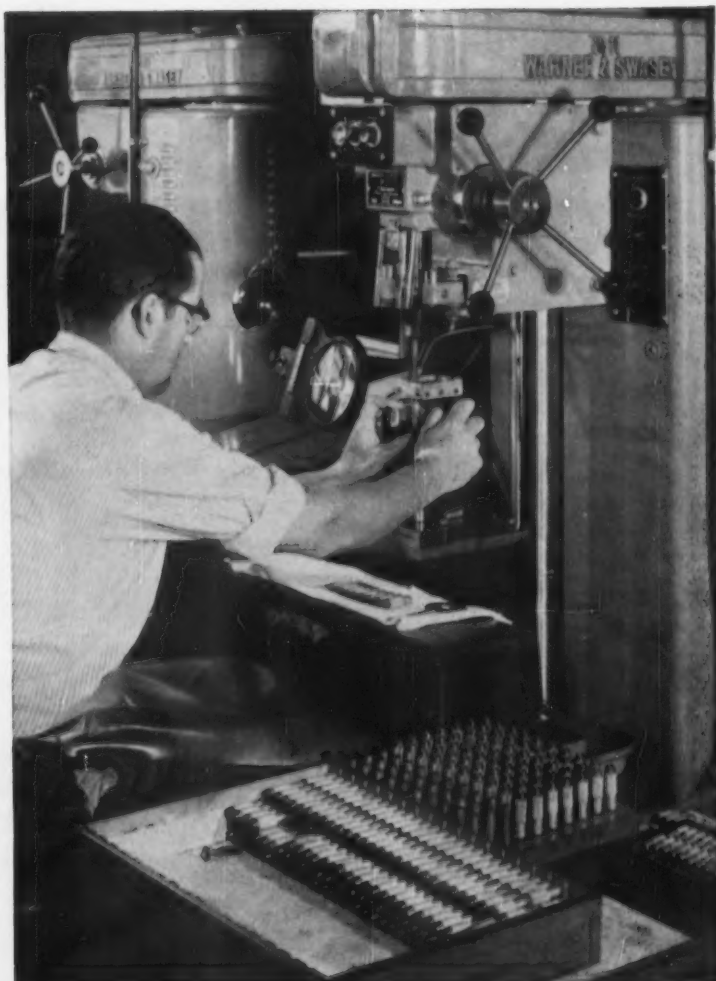
with **Allegheny Metal**

WAG-3209

Warehouse stocks carried by all Ryerson steel plants



All Lufkin Chrome-Clad Micrometers tapped on Warner & Swasey Tapping Machines



*Warner & Swasey No. 11 Precision Tapping and Threading Machine
in use at Lufkin Rule Company, Saginaw, Michigan.*

THE NAME, LUFKIN, has long been associated with extreme accuracy by users of precision measuring instruments. However, many man-hours of selective assembly were required to assure such accuracy in Lufkin Micrometers—until Warner & Swasey helped simplify and speed up their production.

Now Warner & Swasey No. 11 Precision Tapping and Threading Machines tap the high precision threads necessary in the hub and in the thimble of the micrometer. They perform each of these tapping operations in one pass, where three were previously required. And Warner & Swasey's positive lead screw principle maintains an accurate and constant lead control in these threads. No longer must an operator "feel" his way into the work by hand, or risk damage to the finished threads on withdrawal.

But of particular importance to Lufkin, operators

can now qualify the starting positions of the taps so the "zero" mark on the micrometer's thimble matches perfectly with the reading lines on the hub when assembled. This drastically reduces the time-consuming selective and individual fitting of thimble to hub formerly necessary.

Where your work requires extreme threading accuracy on a production scale, call in your nearest Warner & Swasey Field Representative. He'll explain the many unique features of the No. 11 Precision Tapping and Threading Machine, and show you how it can improve your tapping operations.



YOU CAN PRODUCE IT BETTER, FASTER, FOR LESS...WITH A WARNER & SWASEY

The world's largest opens a new era of

ABOUT one year ago, the largest die-casting machine in the world was completed and put into operation by Doehler-Jarvis Division of National Lead Company in cooperation with Kaiser Aluminum & Chemical Corporation.

Recently, the huge machine successfully produced the largest aluminum die-casting ever made—a six-cylinder in-line engine block weighing about 130 pounds less than a similar gray iron block.

The successful production of such a large and complex die-casting points the way to the design of large and economical die-cast aluminum parts for many industries.

Such parts would benefit from all the advantages of the die-casting process, which is inherently suited for mass production of parts requiring close dimensional tolerances, smooth surfaces, clean and sharp detail and thin metal sections.

It is also possible to cast many details to size on the large press. In many cases, this eliminates the need to drill holes and other machin-

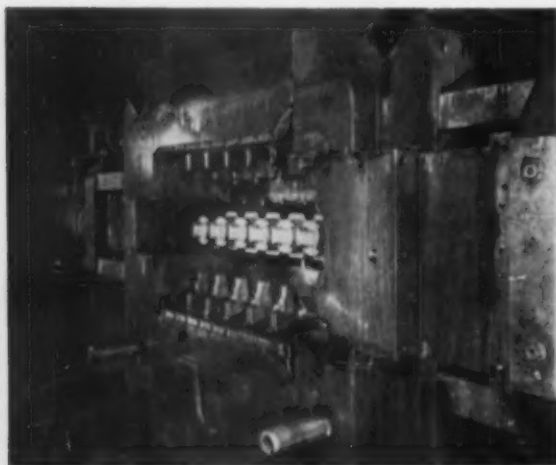
ing operations. Threads may often be cast to size, thus eliminating a threading operation. Cast-in metal inserts are readily included in die-castings.

Overall dimensional accuracy is another feature of die-castings that is important to many parts. This reduces the amount of finish allowance when parts are machined to a prescribed overall dimension.

In addition, die-castings are generally lighter in weight than the equivalent parts made in sand or permanent mold, because thinner metal sections and less draft are permissible.

The metal quality of die-casting is more uniform than in a typical sand casting. Therefore, service life is more uniform.

Product designers and engineers should investigate this new Doehler-Jarvis Division of National Lead development in aluminum die-casting without delay to see if your existing or new designs can take advantage of the new 72" machine.

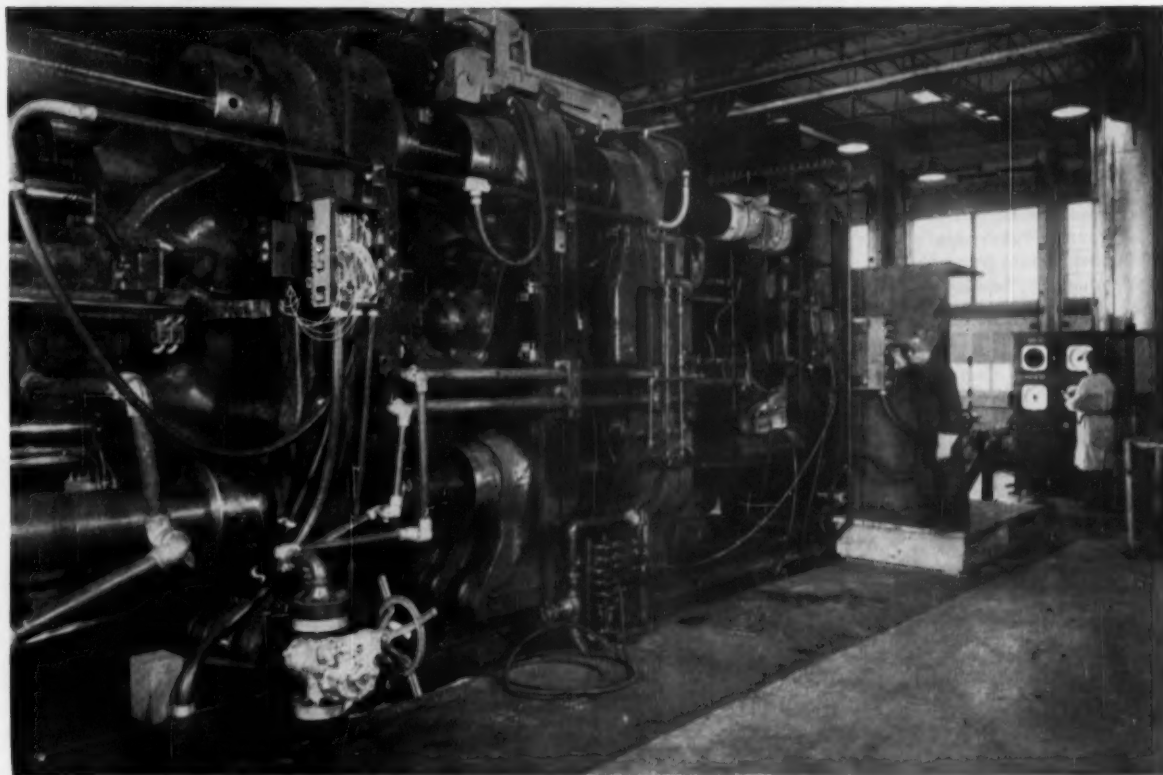


Machine open with dies for aluminum engine block in place.



Aluminum engine block being lifted from die after cast.

die-casting machine product design!



The new Doehler-Jarvis 72" die-casting machine—the world's largest—located at Toledo Plant.



Engine blocks were die cast by Doehler-Jarvis.

If you need assistance with aluminum . . .

Let us work in partnership with you. We are eager to share our knowledge of aluminum and engineering skill. Development engineers will gladly provide engineering service and counsel on design and alloy selection which may give you a better product at a lower cost. Kaiser Aluminum & Chemical Sales, Inc., *General Sales Office*, Palmolive Bldg., Chicago 11, Illinois; *Executive Office*, Kaiser Bldg., Oakland 12, California; *DETROIT OFFICE*, 1414 Fisher Bldg., Detroit 2, Michigan, Phone Trinity 3-8000.

Kaiser Aluminum

setting the pace—in growth, quality and service

WILLIAMS-WHITE GANTRY PRESSES

for Large or Small Straightening Operations



The two presses shown illustrate the versatility of gantry type design and construction as applied to WILLIAMS-WHITE hydraulic straightening presses.

A WILLIAMS-WHITE Gantry Type, Hydraulic Press can be built to your specifications for operations as diversified as straightening heavy plate or weldments (photograph 5500) or production bending and straightening operations (photograph 5323).



5500→

Capacity	400 tons
Working face of bed, R-L, F-B	20' x 13'
Daylight, bottom of ram to bed	48"
Stroke	24"
Cross travel of hydraulic ram	130"
Longitudinal travel of gantry	15'

5323→

Capacity	75 tons
Bed, length and width	144" x 22"
Daylight	26"
Stroke	12"

For additional information regarding WILLIAMS-WHITE Production Machinery, write for BULLETIN 203.



BUILDERS OF MACHINERY SINCE 1854

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SEIFREAT-ELSTAD MACHINERY CO.
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Dayton, Ohio

EDWARD A. LYNCH MACHINERY CO.
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GEORGE A. DAVIES, Jr. MACHINERY CO.
Los Angeles, Calif.

WILLIAMS-WHITE & Co.

302 EIGHTH ST. • MOLINE, ILLINOIS • EST. 1854



LIGHTen Your Cost-Load *Switch to* **AMERICAN PHILLIPS** **SCREWS**

for Assured Savings on Any Assembly

Just the simple job of putting protective covers on your switch-plates is enough to prove the basic Phillips savings . . . which can be multiplied in your plant's production departments.

First, you get automatically straight driving . . . with no fumbling, wobbling, or dropping of screws. And what you *don't* get are any scarred work-surfaces or injured workers. All of which adds up to as much as 50% time-savings over out-dated methods . . . and plainly proves that Phillips Screws *always* cost least to use.

Now add the special advantages of American Phillips Screws . . . an always dependable supply from one of the screw industry's top-production plants . . . unlimited range of standard and special Phillips fasteners . . . acknowledged engineering leadership based on know-how plus follow-through . . . and you can clearly light your own way to making your assembly operations more productive and less costly than with any other fastening method. Write:

X marks the spot . . .
the mark of extra quality

AMERICAN SCREW CO.

PHILLIPS HEADquarters
WILLIMANTIC, CONNECTICUT

Plants at Willimantic, Conn. and at Norristown, Pa.
Warehouse and office at Chicago
Office, Detroit, Michigan



Palletized "Moly" is

easier

to handle



Traditionally, molybdenum has been packaged in bags and cans, with weather conditions, storage, and equipment problems frequently resulting in an awkward handling situation for the steel manufacturer.

Now, MCA is first again in offering a standard wooden pallet, with either 100 bags or 64 cans steel-strapped securely in place. The full pallet is easily and safely moved by lift truck to storage

location or direct to the furnace. The pallets are expendable, and but a small nominal charge is made to customers authorizing this form of shipment.

We are confident the new "Moly" palletizing system will more than justify your expectations.

Send now for the new MCA pamphlet—
"Molybdenum—Now Palletized"



MOLYBDENUM

CORPORATION OF AMERICA

Grant Building

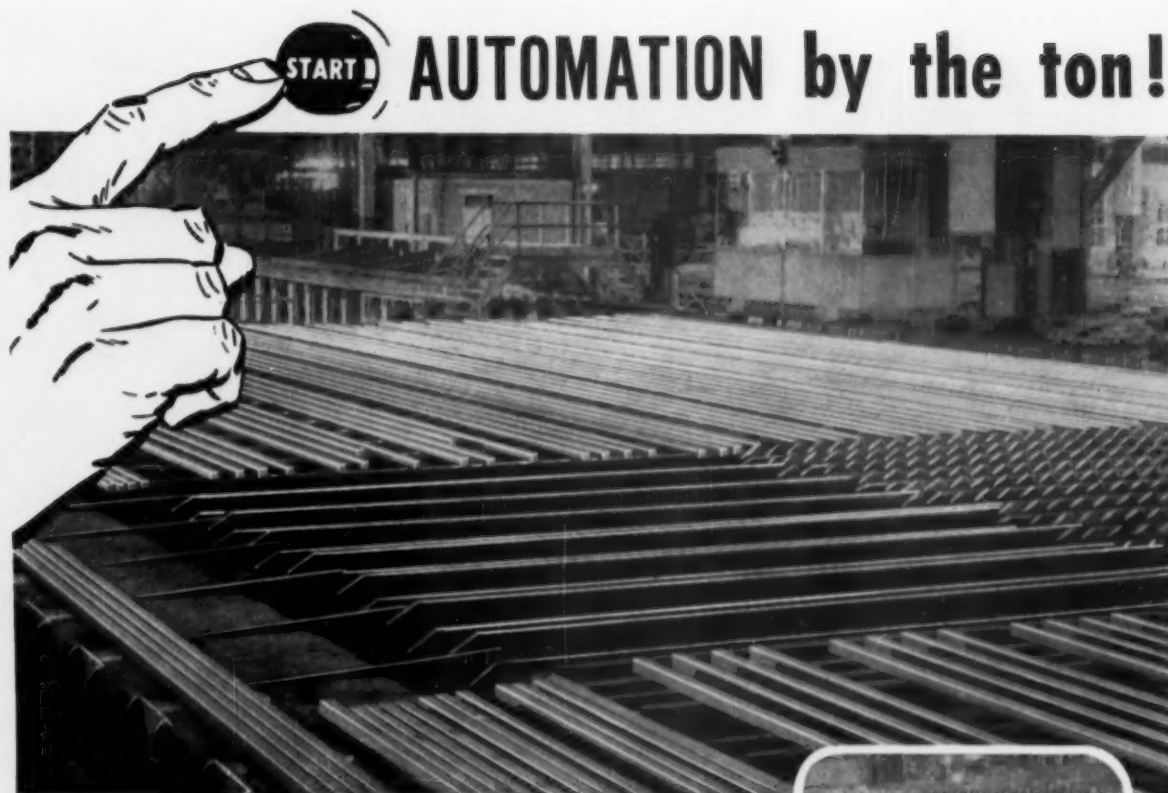
Pittsburgh 19, Pa.

Offices: Pittsburgh, Chicago, Detroit, Los Angeles, New York, San Francisco

Sales Representatives: Edgar L. Fink, Detroit; Brumley-Danaldson Co., Los Angeles, San Francisco

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BIRDSBORO'S
modern design cooling bed...
engineered for maximum production



● It permits maximum production from any mill because cooling beds like this are geared to coordinate the entire operation. This huge bed handles tremendous tonnages of a wide variety of semi-finished products.

The first section of the bed consists of V-bars with either notched or flat surfaces—depending on the type of product handled. These bars are precision machined to hold billets straight during the cooling period. The flat bar section, following the first section, increases the capacity by providing additional cooling time for heavy sections.

This is another Birdsboro product built to meet specifications for higher production in leading steel mills throughout the world. Call on Birdsboro engineers when *your* production figures need a boost.

Designers and Builders of:

STEEL MILL MACHINERY
HYDRAULIC PRESSES
CRUSHING MACHINERY
SPECIAL MACHINERY

STEEL CASTINGS

Weldments "CAST-WELD" Design

ROLLS: Steel, Alloy Iron, Alloy Steel

BIRDSBORO

BIRDSBORO STEEL FOUNDRY & MACHINE CO., BIRDSBORO, PENNA. Offices in Birdsboro, Pa. and Pittsburgh, Pa.



It Costs No More To Give More— If You Give The Bonus In Savings Bonds!

If your company is one of the more than 45,000 companies that have the Payroll Savings Plan you *know* what your employees think of Savings Bonds—they spell it out for you every month in their Savings Bond allotments.

If you don't have the Payroll Savings Plan, and are wondering whether your people would like to receive their bonus in Bonds, here are a few significant facts:

- every month, *before they get their pay checks or envelopes*—8,500,000 men and women enrolled in the Payroll Savings Plan invest \$160,000,000 in U. S. Savings Bonds.
- Payroll Savers hold their Bonds: From May 1, 1951, to September 30, 1955, approximately \$18.7 billion E Bonds reached 10-year maturity dates.

On September 30, 1955, approximately 70.3% of the matured bonds were retained by their owners under the automatic extension plan. With additional interest earned since maturity dates (\$560 million), cash value of the matured bonds held by individuals amounts to approximately \$13.7 billion.

—on September 30, 1955, the cash value of Series E and H Bonds—the kind sold only to individuals—totaled 39.7 billion dollars, a new high.

To the Payroll Saver, and to the man who buys his Bonds at a bank (because his company does not provide the Payroll Savings Plan) a One Hundred Dollar Savings Bond looks bigger and better and is bigger and better, than a check for \$75. *Make this a merrier Christmas for every employee. Give the gift that keeps on giving.*


The United States Government does not pay for this advertising. The Treasury Department thanks, for their patriotic donation, the Advertising Council and

The **Iron Age**



USS COR-TEN STEEL

**gives strength and extra corrosion resistance
to hull of pleasure yacht**



The pride of Ingalls is the new Rhonda III. This new yacht, which features many other new shipbuilding practices in addition to the use of light weight, corrosion-resistant COR-TEN Steel hull construction, was designed by M. Rosenblatt & Son, Naval Architects and Marine Engineers of New York City.

The Ingalls Shipbuilding Corp., of Birmingham, Alabama, has been constructing ocean-going vessels of many types for more than 25 years. This vast experience paid off when it came to the design of this beautiful new-type 96-foot yacht—and the decision to use USS COR-TEN High Strength Steel to give extra strength and corrosion resistance to the Rhonda's hull.

In a new booklet describing many of the unusual features of their new RHONDA III, The Ingalls Shipbuilding Corp., explains their reasons for the choice of USS COR-TEN High Strength Steel:

"Rhonda III is constructed almost entirely of all-welded COR-TEN corrosion-resistant steel. No rivets whatsoever are used. Most hull plating is 7.65 pounds or $\frac{3}{16}$ " thick. Early in the design stage extensive investigations and tests of specially designed steel panels with widely spaced weld beads were conducted to determine optimum size and length of welds for the best possible combination of strength and fairness. In the opinion of the designers, whose experience covers many years of foreign as well as domestic yacht and ship building, RHONDA III's hull is the finest example of a fair light welded steel hull. Despite this, strength and sea-worthiness have in no way been compromised."

Here again USS COR-TEN High Strength Steel was selected because of its proved ability to reduce deadweight and to stand up under corrosive conditions—even when it's the severe combination of salt water and ocean atmospheres.

NOW AVAILABLE . . . our new "Design Manual for High Strength Steels" is ready for distribution. This excellent book contains comprehensive and practical information that you will find extremely useful in designing your product for greater economy and efficiency by the sound use of high strength steels.

For your free copy, write on your company letterhead, giving title or department, to United States Steel Corporation, Room 5049, 525 William Penn Place, Pittsburgh 30, Pa.

UNITED STATES STEEL CORPORATION, PITTSBURGH • AMERICAN STEEL & WIRE DIVISION, CLEVELAND • COLUMBIA-GENEVA STEEL DIVISION, SAN FRANCISCO
NATIONAL TUBE DIVISION, PITTSBURGH • TENNESSEE COAL & IRON DIVISION, FAIRFIELD, ALA. • UNITED STATES STEEL SUPPLY DIVISION, WAREHOUSE DISTRIBUTORS
UNITED STATES STEEL EXPORT COMPANY, NEW YORK

USS HIGH STRENGTH STEELS

USS MAN-TEN • USS COR-TEN • USS TRI-TEN



5-1027

UNITED STATES STEEL

"A Tough Job Today- Routine Tomorrow"

says

R. O. Thomas

U. S. Steel's

Forging

Superintendent



THE PICTURE SHOWS the very heart of a horizontal extrusion press being built by the Loewy Construction Company for the Air Force heavy press program. It is the press container—forged, machined and assembled at the U.S. Steel Homestead Forgings Division.

It is the container which must sustain the high pressures exerted on the hot billet as it is forced through a die to form the extruded shape. In extruding an aluminum alloy, for example, the container itself is electrically heated to above the 800° F temperature of the billet—hot enough to soften ordinary steels.

This container is made by shrinking together several steel sleeves, similar to the way big naval guns are constructed. The result is an extremely strong assembly without undue bulk, able to withstand the tremendous pressure exerted during extrusion. The liner (the highly polished inside part), primarily a heat resistant member, is forged from tungsten-chromium-molybdenum-steel, heat treated to a very high hardness to resist deformation. Over this liner is a heavy forged alloy steel liner holder. Next come five forged alloy steel rings that build the total outside diameter to over six feet.

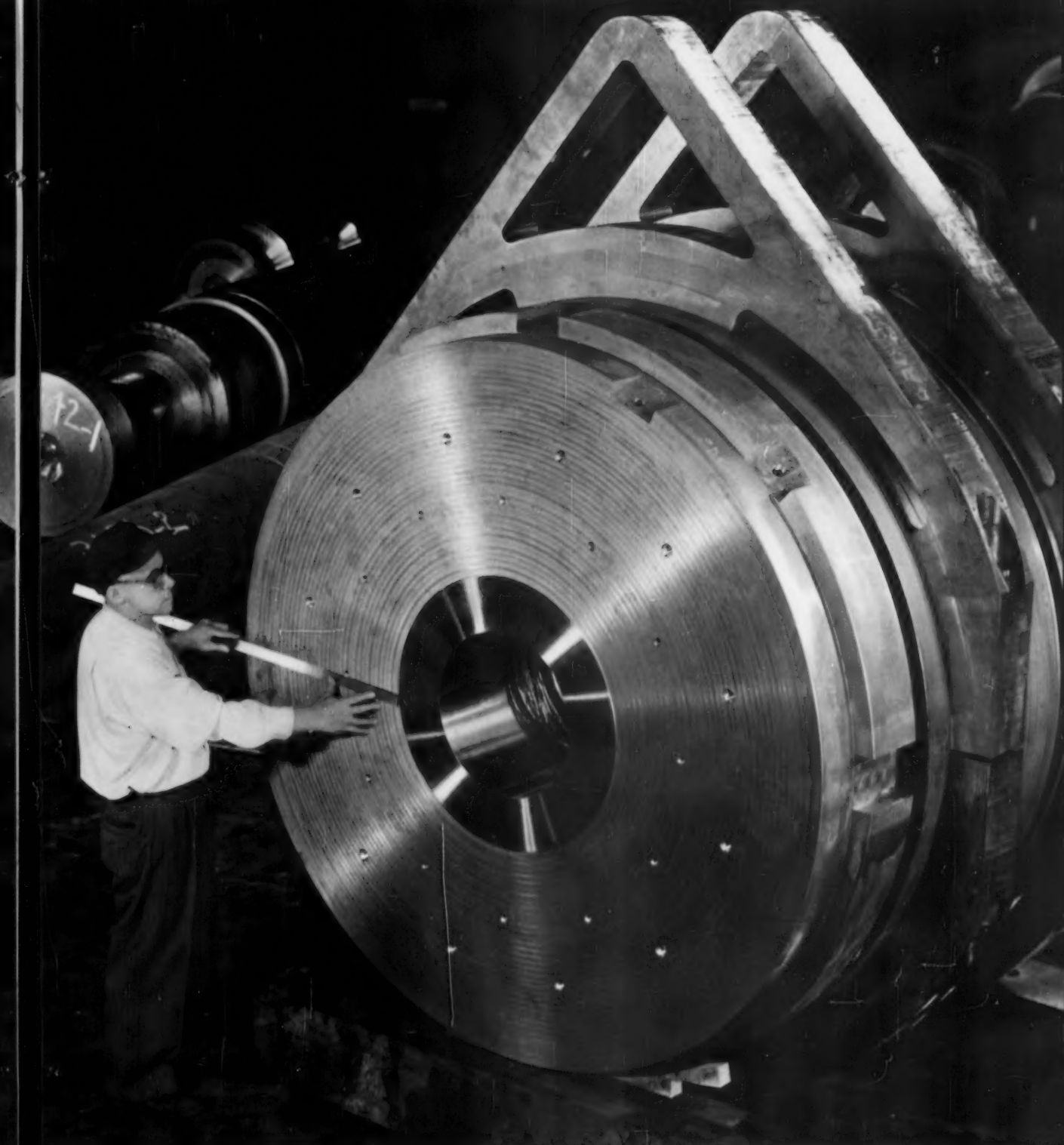
When this press was first proposed, some segments of the industry felt that it would be most difficult, if not impossible, to meet the specifications. In answer, the first units have been shipped from the Homestead Forgings Division after passing all requirements . . . and more units are on the way.

If you would like a free copy of our 32-page booklet that gives the background of USS Quality Forgings, write to United States Steel, Room 5049, 525 William Penn Place, Pittsburgh 30, Pennsylvania.

SEE THE UNITED STATES STEEL HOUR. It's a full-hour TV program presented every other week by United States Steel. Consult your newspaper for time and station.



UNITED STATES STEEL



USS
Quality
FORGINGS

heavy machinery parts — carbon, alloy, stainless

forged steel rolls and back-up roll sleeves

electrical and water wheel shafts

hammer bases and columns

HOW TO BUY RUBBER HOSE

FOR LONG LIFE IN ROUGH SERVICE

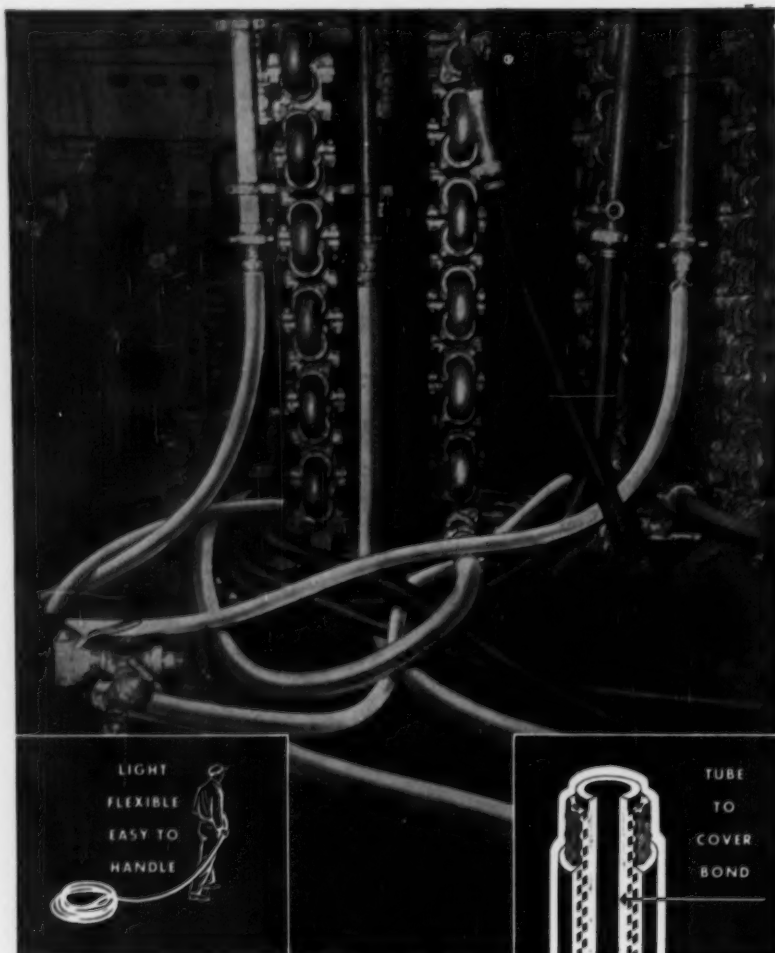
... and get
"More Use per Dollar"

Look for a hose construction that is easy to handle, yet strong enough to stand up under tough operating conditions.

It is not necessary for hose to be thick and stiff and heavy. It can be light in weight and still withstand hard use on the job. The lighter the weight, the easier the hose is to handle . . . the better men will like to work with it with less fatigue. Be sure, too, that the hose you buy is the most flexible for the type or diameter you need. If it coils and uncoils easily it is not only easier to handle, there is less internal stress . . . and no kinking, breaking or separation of cover, tube or plies.

If the hose does not kink, it will last longer and you'll get full flow at all times . . . even though it is dragged over rough terrain.

Specify by name the hose construction that combines light weight, flexibility and non-kinking characteristics with maximum safety . . . specify Raybestos-Manhattan Homoflex Hose.



HOMOFLEX HOSE

This is an exclusive R/M construction made in types for handling air, water, gases and other general uses. It has a homogeneous, inseparable tube-to-cover bond. It's as flexible as a rope, light and easy to handle, yet strong enough for the toughest jobs. It maintains uniform inside and outside diameters for

easy coupling. . . Homoflex Hose reduces hose costs by increasing hose life . . . and it's only one of many types an R/M representative can help you select for both general and special purposes. Let him show you why R/M Hose lasts much longer . . . gives you "More Use per Dollar".

RM-807-P



MANHATTAN RUBBER DIVISION — PASSAIC, NEW JERSEY

RAYBESTOS-MANHATTAN, INC.



V-Belts



Conveyor Belts



Roll Covering



Tank Lining



Abrasive Wheels



Flat Belts



Hose

Other R/M products include: Industrial Rubber • Fan Belts • Radiator Hose • Brake Linings • Brake Blocks • Clutch Facings • Asbestos Textiles • Packings • Engineered Plastic, and Sintered Metal Products • Bowling Balls

IF
YOU
MAKE

Springs

YOU'LL DO BETTER WITH ROEBLING

ROEBLING makes high carbon steel spring wire and flat spring steel...and makes it *better*...for every sort of spring and for every product that requires spring characteristics. Hard drawn, hard rolled, annealed or soft, tempered or untempered ...they're all available to meet your requirements exactly.

Among these Roebbling materials are zig-zag and no-sag wires; mechanical and valve spring wires; music wire; clock and motor type spring wires; flat spring steel and upholstery spring wire of all types. The variety of parts into which these are formed is almost endless, but manufacturers all report that Roebbling quality and uniformity reduce machine downtime.

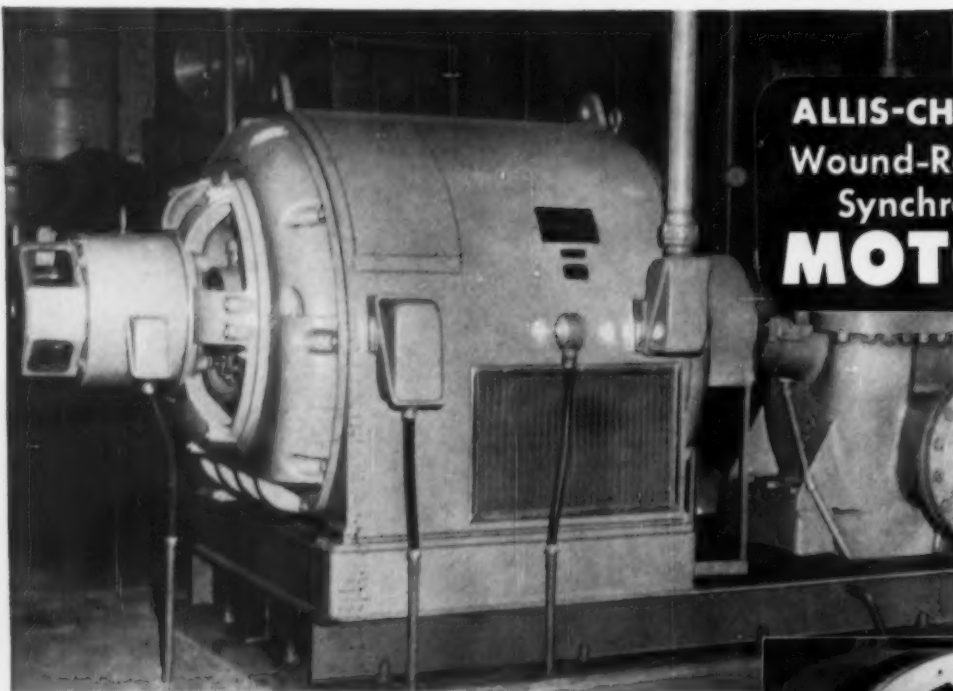
Learn for yourself how Roebbling can help your production and product. John A. Roebbling's Sons Corp., Trenton 2, N. J.



ROEBLING

Subsidiary of The Colorado Fuel and Iron Corporation

ATLANTA, 934 AVON AVE. • BOSTON, 51 SLEEPER ST. & 5 PITTSBURGH ST. • CHICAGO, 5525 W. ROOSEVELT RD. • CINCINNATI, 3263 FREEDOM AVE. • CLEVELAND, 13226 LAKEWOOD HEIGHTS BLVD. • DENVER, 4801 JACKSON ST. • DETROIT, 915 FISHER BLDG. • HOUSTON, 6216 NAVIGATION BLVD. • LOS ANGELES, 5340 E. HARBOR ST. • NEW YORK, 19 RECTOR ST. • ODessa, TEXAS, 1920 E. 2ND ST. • PHILADELPHIA, 230 VINE ST. • ROCHESTER, 1 FLINT ST. • SAN FRANCISCO, 1740 17TH ST. • SEATTLE, 900 1ST AVE. S. • ST. LOUIS, 3001 DELMAR BLVD. • TULSA, 321 N. CHEYENNE ST. • EXPORT SALES OFFICE, 19 RECTOR ST., NEW YORK



ALLIS-CHALMERS Wound-Rotor and Synchronous **MOTORS**

Shown is a 400-hp, 900-rpm end-shield bearing synchronous motor. Other Allis-Chalmers motors of this design are available from 250 hp at 300 rpm and up, in drip-proof and splash-proof construction.

Now full protection without loss of accessibility

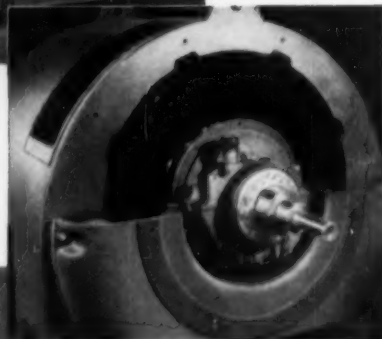
All parts, including slip rings and leads, are enclosed — yet removable inspection covers and end-shield sections simplify maintenance.

These motors combine modern functional design with maximum protection and accessibility.

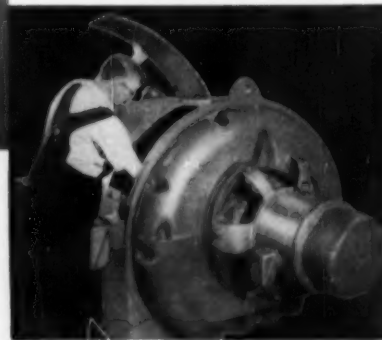
Here are some of the important features:

- Collectors and brushes are protected by box-type stator yoke from physical damage, dripping moisture, dust and dirt.
- Cast end shields provide rigid bearing support and full protection for motor windings.
- Slip-ring leads are brought out to a terminal box — they are not left exposed.
- Capsule-type sleeve bearings permit inspection or cleaning of motor windings without exposing interior of bearing to dirt.
- Access covers are secured by easy-operating, self-locking fasteners for ready removal.

Get details — Call your nearby A-C office, or write Allis-Chalmers, Power Equipment Division, Milwaukee 1, Wisconsin. Ask for Bulletin 05R8183.



Note accessibility offered by generous size opening covers. Upper half of end shield is removable for entrance to motor winding.



ALLIS-CHALMERS

A-4847

The Iron Age Newsfront

Theft Poses Shipping Problems

With some grades of stainless steel scrap selling for as much as \$340 per ton, shippers and consumers are encountering a theft problem on the railroads. The racket has reached the point where dealers refuse to ship in anything but box cars. This poses an unloading problem for users who are set up to unload from open gondolas.

New Process Recovers Metals

A recently developed process provides a practical method for recovering metal from grindings. Initial development concerned itself primarily with recovery of nickel and nickel alloys, but the process is said to be adaptable to other metals as well—including recovery of iron from ore fines. The process utilizes compression and temperatures up to 7000°F.

Aim At Boost In Farm Market Potential

Manufacturers of farm equipment are preparing another wave of model changes that will duplicate the stiff competitive push which began in 1954. Atmosphere around some plants suggests the hushed-up feeling around an automotive plant about ready to announce a new model. One effect of the extensive changes has been the higher manufacturing levels set for January and February—more so than usual.

Expert Debunks Recognition Angle

Management is overdoing such concepts as recognition in personnel policy. So says a prominent placement specialist. A recent survey of 1000 applicants for new jobs at executive and junior executive levels showed the overwhelming reason for change was more cash in the pay envelope.

Which Crankshaft Will It Be?

The competitive cost struggle between cast automobile crankshafts and forged crankshafts has reached the point where the decision can go either way. Recently, a long-time user of forged crankshafts turned to the cast variety.

while an equally long-time user of cast crankshafts made a switch to the forged shaft.

Radiography Costs Cut By New Method

Significant advantages, particularly in ordinance where film and processing costs run quite high, are claimed for a new method of producing radiographic images. Photosensitive materials are not used. Called Ionography, the system utilizes an inexpensive reusable plate and makes daylight inspection possible at low cost.

Vacuum Melting Steps Forward

Vacuum melting is catching on at an unprecedented rate. Current estimates indicate an average increase in equipment sales of about 300 pct over the 1950 to 1953 period. The trend is still pointing upward, so that equipment deliveries will be even tighter in 1956.

It's The Humidity . . .

U. S. Army has dropped plans for developing an abandoned limestone mine in western Pennsylvania as a machine tool storage depot. The military and mine owners were unable to agree on a purchase price for the old workings. Engineering surveys indicated the plan was feasible, although the dehumidifying problem was an important drawback.

Make Pitch To Can Companies

Developers of a vacuum process for depositing aluminum on black plate are now approaching the can companies after having been turned down by the steel firms. The developers claim that corrosion tests with tomatoes and other products give their can a good bill of health.

Solar Furnaces Ready For Industry

A spokesman for a French firm which has four solar furnaces believes that solar energy can now be used for some commercial purposes. Using centrifugal furnaces, 27-lb batches of 99.5 pct zirconium oxide were made from zirconium silicate. Melting point was 4900°F.



Looking for a **TOUGHER STEEL?**

Unusually tough, even at sub-zero temperatures,
Lukens "T-1" steel can reduce equipment costs.

Failure from abrasion or from impact can happen to the steel in your equipment, too. Here's the answer—the tougher steel you've been looking for. Lukens "T-1" steel has excellent resistance to the combination of wear and impact, is tough enough to withstand unusual stresses and pressures as well as shock at either sub-zero or high temperatures, thus lowering maintenance costs and lengthening equipment life.

Equipment builders will find that the techniques of working with this new steel are no different than with carbon steel. Lukens "T-1" steel can be fabricated not only in the shop but also in the field, through proper design procedures. Because of its high yield strength (over 90,000 psi) this new steel offers lighter weight and reduced thickness in comparison to heavier, thicker plates of carbon

steel, thereby reducing material, fabrication and shipping costs. And Lukens' range of steel plate sizes—including the widest and heaviest plates available anywhere—makes possible additional savings for equipment builders through the use of wider plates that require fewer welded seams.

The latest addition to Lukens' complete line of carbon, alloy and clad steels, this quenched and tempered alloy plate steel's unusual combination of properties suit it especially to application in pressure vessels, bridges, shipbuilding, construction machinery and general industrial equipment. On problems of design, selection, application and fabricating techniques, Lukens offers full technical assistance. If you would like further information on Lukens "T-1" steel, write to: Manager, Marketing Service, 772 Lukens Building, Lukens Steel Company, Coatesville, Pa.

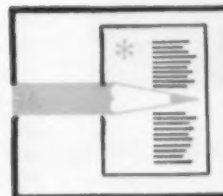


"T-1" STEEL

THE NEWEST IN A COMPLETE LINE OF ALLOY STEELS

LUKENS STEEL COMPANY, COATESVILLE, PENNSYLVANIA

To get the new, 28-page book on
Lukens "T-1" steel, ask for Bulletin 781.



COPPER: Help On The Way From Peru

Big mine development project is expected to bring more copper to U. S. in five years . . . More than \$208 million will be spent . . . Mine is expected to produce 10 million tons for U. S.—By Tom Campbell.

◆ ASK ANY copper user. He will tell you that the shortage is here for some time to come. Copper people, when pressured for a definite answer, will tell you the same thing. Check around the metal trade and others will tell you that copper is taking a shellacking from other metals. But don't lose hope for this metal.

Aluminum is short today. It will be short for awhile. Even so it is cutting in on copper. Copper supply has taken a beating from strikes, heavy military need, and a skyrocketing civilian demand.

Recent news suggests that in the next several years copper will have picked up many of its old customers, shrugged off a lot of the shortage and re-established its growth output.

But this will not happen overnight. Copper people will nurse their present and anticipated wounds while stepping up output in the face of labor troubles, government demand, and price gyrations.

Help From Peru

There are new fields to conquer. Those going into these fields are not troubled by the present series of crises—which only intensify the challenge for pioneering.

There is a lot of copper in Peru. It won't help out in the U. S. during the current shortage. But within five years copper from one of the biggest developments in recent times will be flowing from Peru to refineries in this country. The big project is fathered by Southern Peru Copper Corp. This company is owned by: American Smelting & Refining Co., Phelps

Dodge Corp., Newmont Mining Co. and Cerro de Pasco. Southern Peru Copper has a long term lease and mining concession from the Peruvian government. Relations between Peru and American developers are excellent.

In imagination, size and potential this new venture — which eventually will turn up 10 million tons of copper—rivals the gigantic iron ore jobs in Canada and South America.

Foresee Bonanza

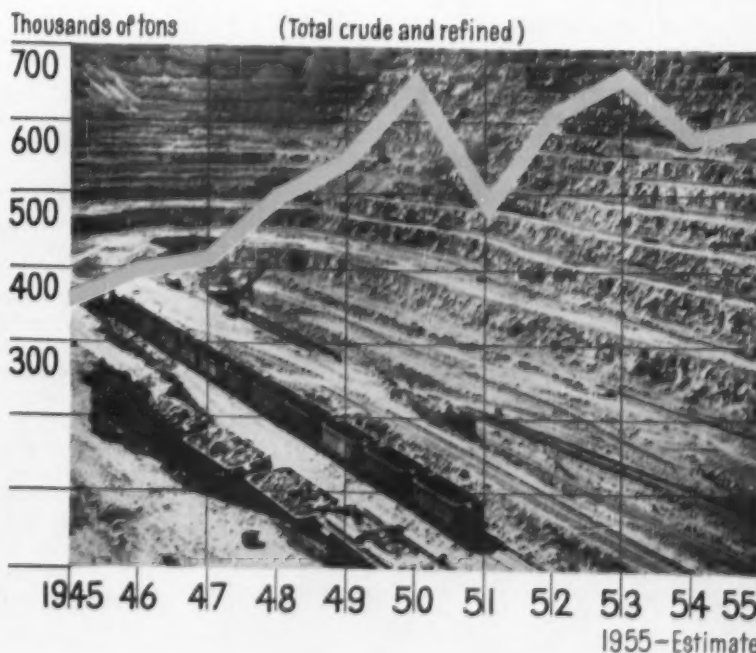
Before a pound of concentrate is smelted more than \$208 million will be spent for equipment, roads

(or railroad), concentrating plant, smelter, port town and mine town. And before one ton of ore is concentrated more than 130 million tons of overburden must be removed!

Last week top officials of the newly formed company returned from southern Peru more convinced than ever that the project will be a bonanza for Peru and the U. S. They have not yet decided whether the 100 mile distance from the mines to the port town of Ilo will be connected by a highway or by railroad. Decision will be made next year.

The first contract on the job has

Copper Import Trend Is Up



SPECIAL REPORT

been let to Foley Bros. This \$1.3 million initial job involves docks and other facilities at the port town so that equipment and machinery can be landed soon.

It will take about five years to remove overburden. Needed for this stripping operation are: 80 rear dump trucks of the 20 yard class; 10 power shovels of the 8 yard capacity class; and other earth moving equipment; bulldozers and graders. Since deliveries on these items are already far extended in this country, it is believed that Southern Peru had tentative orders in for the equipment. If not, some plans may have to be shifted to conform with later deliveries.

Plant Site Decided

The mining town to be located close to the mines and at about 8500 ft. altitude (compared with the mine altitude of 11,000 ft.) will be named Toque Pala (Touch a Stick). When things settle down to a stabilized activity at the mine, population will be about 10,000 at the town site. Before that time the usual boom town is expected to hold forth.

Concentrating equipment will

be installed at the mines. Present plans call for the smelting plant to be located at Ilo, the port town. At present Ilo is a small fishing and canning hamlet located on the extreme southeastern coast of Peru.

Population at Ilo now is about 1100 people. But soon that figure will skyrocket as engineers, construction people and the mining vanguard move in. Eventually the port town will grow to about 3000 or more. The smelter on the coast will employ about 600 workmen. About 2800 workmen will be employed in the mining and transportation operation. Undoubtedly the shipbuilding for the project will not be a small item.

The companies owning Southern Peru Copper have pooled some of their best engineering, mining and transportation brains in an effort to hold down total expenditures. Nature usually has a way of increasing the amounts initially set up by estimate and slide rule.

But nature also usually compensates on geological estimates of reserves. Probably more ore will be found than the 1.1 billion ton reserves indicated so far. This estimated reserve is expected to produce about 10 million tons of copper during the life of the operation.

This project is another in a



DESTINATION: USA. U. S. Steel Corp. and Bethlehem Steel Co. have invested over \$300 million in Venezuela iron ore. Boatload here and that below are bound for U. S.

long line of investments in countries to the north and south of the United States. It, like the others, points up the growing dependence of the U. S. upon the mineral reserves of Canada and South America.

Iron ore production in Venezuela this year, for example, is expected to exceed 8 million tons, largest yet. This represents the combined productions of mines operated by U. S. Steel Corp. and Bethlehem Steel Co.



Canada and So. America Minerals: Arsenal for U. S.

It is now crystal clear that the United States will lean heavily upon Canada and South America for its minerals of the future.

An early development for consumption in the States was Steep Rock Iron Mines in Canada. It is to expand further in the years to come. Then came the gigantic Quebec-Labrador iron ore development which cost its American owner-consumers more than \$300 million.

Then there is the mammoth Cerro Bolivar iron ore development that started shipping early in 1964. This year it will account for 6 million tons of U. S. Steel's foreign ore, some of it shown being loaded here.

Scattered in between these projects have been important deals involving aluminum and titanium oxides. Still to flourish are additional iron ore projects at Ungava Bay in upper Quebec.

CONGRESS: Will Sit Tight On Fast Tax

Battle rages over whether tax-am law should be repealed or improved . . . But chances are Congress will take no action either way . . . Pros and cons of the issue argued at Committee hearing.

♦ **HARD-WON** accelerated depreciation provision of the 1954 tax code is still being debated in Congress. Opposing sides argue that it's a giveaway and ought to be repealed, or that it's a step in the right direction and should be amended to become even more effective.

Outlook for action on either score is almost nil.

The provision gives business the option of depreciating between two-thirds and three-quarters of the cost of new plant and equipment in five years, instead of the normal 20 to 40 years.

Critics argue that the law will aggravate recessions and will cost the government as much as \$100 billion in revenue over the next 25 years. This argument backs up assertions by Democrats that fast depreciation is a giveaway to business and should be repealed.

George Terborgh, research director for the Machinery and Allied Products Institute (MAPI), told a congressional committee that depreciation is not a handout or giveaway to business big or small. He also points out that depreciation is normally the major source of business investment funds.

Broadened or Not?

Several witnesses are urging that the law be broadened so that depreciation allowances take into account the effects of inflation. A taxpayer recovering the cost of a 1940 plant through depreciation allowances is recovering the cost in inflated 1955 dollars, it is contended.

E. Cary Brown, economics professor of the Massachusetts Institute of Technology, warns that too many firms may be basing regular business operations on deprecia-

tion methods which should be reserved for tax purposes.

He says that many firms are tending to use the more rapid depreciation methods in their own accounting systems. "What may be a proper method to stimulate investment under a tax may not be a proper method on which to base business decisions—prices may be too high, dividends too low."

Urges Tax Reduction

The economist also suggests that a better method for the tax laws to encourage investment would be to give firms credit against tax liability or an extra deduction from income for investment. This would be in addition to normal depreciation and therefore

could not be used as extra depreciation in company bookkeeping, he says.

He adds that such a system would have the same incentive effects as accelerated depreciation in stimulating investment.

Another witness, who sides with the group criticizing the depreciation provision, says a drop of 2½ percentage points in the corporate income tax rate would have the same effect as the rapid tax depreciation, but would be better in a declining economy, because it would stimulate investment. He argues that depreciation will not stimulate investment in a recession because depreciation will not necessarily be taken in a declining economy.

Privacy:

Court will decide if company must show union books.

How management may protect its financial records during employee pay disputes will be decided soon by the U. S. Supreme Court.

The high court will determine whether a company is within its rights in refusing to open its books after notifying a union that it cannot meet full demands for a wage raise.

Unions and the National Labor Relations Board argue that employers are compelled to convince workers that pay demands cannot be met. Employers, however, hold that forced opening of company records would violate management rights and reveal private business information to competitors.

In the case to be judged, Truitt Mfg. Co., Greensboro, N. C., a structural steel producer and ironworking firm, refused to pay a 10¢-per-hr raise to employee-members of the Bridge, Structural, and Ornamental Ironworkers of America. The firm offered a 2½¢ hike, but reported that a higher raise would cause business failure.

When Truitt rejected a union request for financial data, the NLRB ordered the firm to comply. The agency held that Truitt was bound to accede, under the good faith bargaining requirements of the Taft-Hartley Act.

Last June, a U. S. Court of Appeals reversed the NLRB order, maintaining that the Taft-Hartley Act language is not intended as a club to force employers to meet wage demands, rather than open their books. The government then appealed the decision.

UNIONS: Are New Labor Laws Needed?

Antitrust and Taft-Hartley laws are only legal weapons against union activity . . . But government exercises little control . . . Direct commercial restraint must be involved—By N. R. Regeimbal.

♦ WITH SOME 16 million workers joined in new super union—the merged CIO-AFL—fight over whether the federal government should have more, or less, control over union activities will mount in Congress.

Unions have been complaining that recent labor legislation contains "union-busting" provisions. But some harassed businessmen probably wonder if there is any control over unions at all.

Answer, now, is that the federal government exercises relatively little control over union organizations.

Only two basic statutes cover labor unions—the antitrust laws and the Taft-Hartley Act. But both acts are carefully written to circumscribe restrictive powers over labor.

Labor Exemptions

Antitrust laws actually still retain the original exemption for labor activities of the Sherman Antitrust Act passed in 1890. Later, the Clayton and Norris-LaGuardia Acts further strengthened the labor exemption for "legitimate" labor objectives, including collective bargaining,

protection of workers, self-organization and association, "for the purpose of negotiating the terms and conditions of their employment or other mutual aid or protection."

It is the "other mutual aid or protection" provision that has been used by unions over the years to cover a multitude of activities.

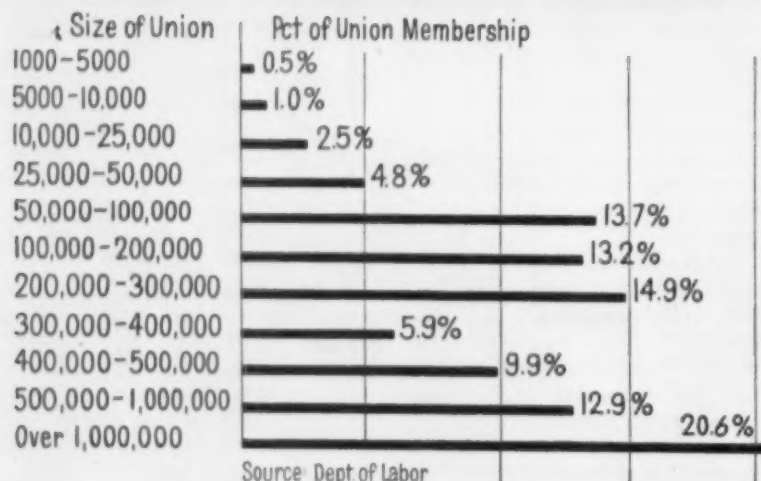
Commercial Restraint

In practice, a high Justice Department official tells THE IRON AGE antitrust laws can be applied against union activities only insofar as a direct commercial restraint is present. The Department has found by bitter experience that most courts will rule against a union only when there is a conspiracy between a union and a commercial party, such as a business or a trade association.

In its report, the controversial Attorney General's committee to study the antitrust laws recognizes that some unions have "engaged in practices aimed directly at commercial market restraints by fixing the kind or amount of products which may be sold in any area, or their market price." After acknowledging that such activities run counter to national antitrust policy, the committee makes the vague recommendation that unions should be prohibited by law from forcing an employer by some legitimate means, such as a strike, from engaging in a market control scheme. The committee says the law should permit the government to proceed against a union on its own initiative, without a formal outside complaint, and actually prohibit private legal action by the employer.

The Taft-Hartley Act also con-

More Members—Fewer Unions



tains some provisions to control union commercial activities. But it may be used only against activities specifically included in the act. It generally governs the relationship between union and the employer, not the union and the general public.

One weakness of the T-H Act, from a business standpoint, is that the National Labor Relations Board can take action under it only after a formal complaint or petition for intervention by an affected party. Experience has shown that many times employers do not want to risk a complaint for fear of legal retaliatory action by the union which may be worse than the immediate problem.

In the last two years, Justice Department has filed 10 cases in which a union was a defendant, and another in which a union was a co-conspirator. Five cases were closed in the same period, only one in which the union was the sole defendant, and it involved violation of an earlier court injunction which had been issued against both the union and an employer.

Among union practices specifically outlawed by the T-H Act are inciting violence; threatening employee job rights; calling strike to scare an employer without any specific bargaining objective, discrimination in permitting workers to join, and some, but not all, secondary boycotts.

Essentials

Boiling down legislative control over unions to essentials, the two laws may restrict unions when they engage in fraud or violence in order to achieve a direct commercial restraint; engage in persuasive tactics outside of the course of a labor dispute, and combine with a non-labor group to affect a commercial restraint.

But because of the force of repeated congressional and court directives that legitimate labor goals must be entirely free of control, government control over illegal union activity is timid.

Government's attitude toward labor isn't likely to change soon. Few are out to prove the claim that unions don't control member votes.

LABOR



NO LOVE appears lost between labor's George Meany and NAM's Charles Sligh as they discuss right-to-work laws at NAM lunch. Laws apply in 17 states.

Welfare Funds:

Committee may ask controlling legislation.

An indignant Senate committee, angered at reports of dishonest handling of employee welfare accounts, is ready to recommend tough new federal controls over pension and welfare funds.

Evidence of the mishandling of funds, including payment of kickbacks for fictitious brokerage services and the padding of union executives' expense accounts, makes the lawmakers suspicious that present laws are inadequate to insure proper use of the money.

In the forefront of those who advocate tighter control is Sen. Gordon Allott, R., Colo., a member of the Senate Labor subcommittee which has been taking testimony concerning fund management. Sen. Allott says information gathered by the group shows a need for new federal legislation.

He would include in it a requirement for full disclosure of facts about welfare and pension funds to every employee and to trustees, employers, and insurance

companies connected with these operations. A second requirement would be sworn statements must be filed with the government, showing all funds retained by brokers and others, commissions paid, administrative fees, and insurance experience and claim rates.

Causing particular concern to the subcommittee was the testimony of Angelo Inciso, president of a Chicago local of the United Auto Workers. He told of luxurious trips, at union expense, to Florida and the West Coast.

SUB Deductible

Treasury Department removes one of the major hurdles to Ford-type supplemental unemployment benefit (SUB) plans by ruling that payments made by firms to trust funds will be deductible business expenses in the year they are made.

Only requirement yet to be met before the plans go into effect at Ford and GM is that states with a total of over two-thirds of each firm's UAW members agree to permit jobless auto workers receive full state unemployment payments at the same time they draw benefits under the SUB plans.

WARNING: Look Before You Give

Solicitations for charity donations, yearbook ads are seldom outright frauds . . . But professional promoters take a big slice . . . Gypsies invade industry with die plating schemes.

♦ YOU ARE sitting at your desk in the middle of a busy day. The phone rings and you hear a hearty voice.

"This is Commander McDougall of the Sons of Future Wars. We're taking a group of disabled veterans on a little outing next week—dinner and the ball game. We wondered if you'd like to help out . . .?"

What should you do? Should you contribute to all yearbooks, drives and the like? Will you lay your company open to retaliation if you don't? There's no set answer to these questions. But one thing you should certainly do on any appeal is get the facts.

The facts in Comdr. McDougall's case will probably turn out something like this: The appeal is probably being conducted by a professional promotion house. Nine out of ten solicitation drives are commercially operated. Professional solicitors will often adopt an appropriate title.

Promoter's Cut

Probably at least half of any funds you give will go to the promoters. Their slice can run as high as 90 pct, may drop to 40 pct, but generally amounts to 50-60 pct.

The society in whose name the

drive is conducted will get a portion of the funds. And disabled veterans will undoubtedly be entertained. But there is no guarantee that the whole amount will go to the outing. In many cases a set number of boys are taken out; the rest of the money goes to the group's kitty.

A good source of this kind of information is your local Better Business Bureau. The bureau doesn't approve or condemn any group or drive. It merely digs up facts. Whether you contribute or not is your own decision. And in most cases there is a legitimate cause and group behind the solicitation. Outright frauds are rare today. The only question is whether you're prepared to see a large portion of your donation go to purely commercial operators.

Don't Worry

One point emphasized by the Better Business Bureau: You have little to fear in the way of retaliation. Frank Nuspickel, of the Philadelphia Bureau, says he knows of no case where a company was subjected to punitive action for failure to contribute to a yearbook, program, or drive by police, union, or veterans groups.

Getting into the area of borderline cases or outright swindles, there are a number making the rounds. Your advertising manager may receive a bill that looks very much like a telephone company statement. It will ask for renewal of your ad in the classified directory.

Very often, the manager will glance at the paper, take it to cover a telephone directory ad, and return a check in the convenient self-addressed envelope. The gimmick, of course, is that you're not doing business with the telephone company. You're paying for an ad in a separate directory.

Even gypsies have successfully invaded metalworking with a scheme for replating old dies and molds. They will work it two ways. They will take a single die section and do a real job of plating it. On the strength of this single piece, they will get an order for a large quantity. Then they either disappear or return the dies with some sort of phony coating. The other trick is to switch prices, changing cents to dollars and increasing the charge from perhaps \$100 to \$1000.

If the idea of gypsies swindling modern business men strikes you as outlandish, you're probably thinking of bandanas and earrings and fortune tellers. Modern gypsies will adopt ordinary Anglo-Saxon names. They claim to rebuild dies by a secret German process known as "monolize." They will talk glibly of molecular structure, have gained audiences with plant engineers, production superintendents and the like.

This kind of thing happens daily in industry. It will continue to happen as long as there are a few "fast bucks" to be made. Only close attention will keep it from happening to you.

Where Charity Sometimes Ends

- Nine out of ten solicitations drives are conducted by professional promoters.
- The group in whose name funds are asked generally get less than half the donations.
- A portion of money collected for a specific project may go to the general organizational kitty.

SECRETARIES: Just One More Shortage

Love and marriage have gloomy sound to personnel managers . . . Many jobs, few applicants for secretaries and typists . . . Schools criticized for not stressing fundamentals . . . More go to college, fewer to work.

♦ THE OFFICE personnel manager finished his telephone conversation with an air of resignation.

"That call is a typical illustration of what we face," he said. "The girl was married recently and has been working here less than a month. Last night her doctor informed her she's pregnant."

This individual case is one that he and every other personnel manager see duplicated with frequency. It's one of the principal reasons for a growing secretarial shortage.

Love and marriage are all very wonderful—to everybody but the personnel managers. Against a relatively small supply of qualified secretaries, they face the combination of increasingly early marriage and motherhood.

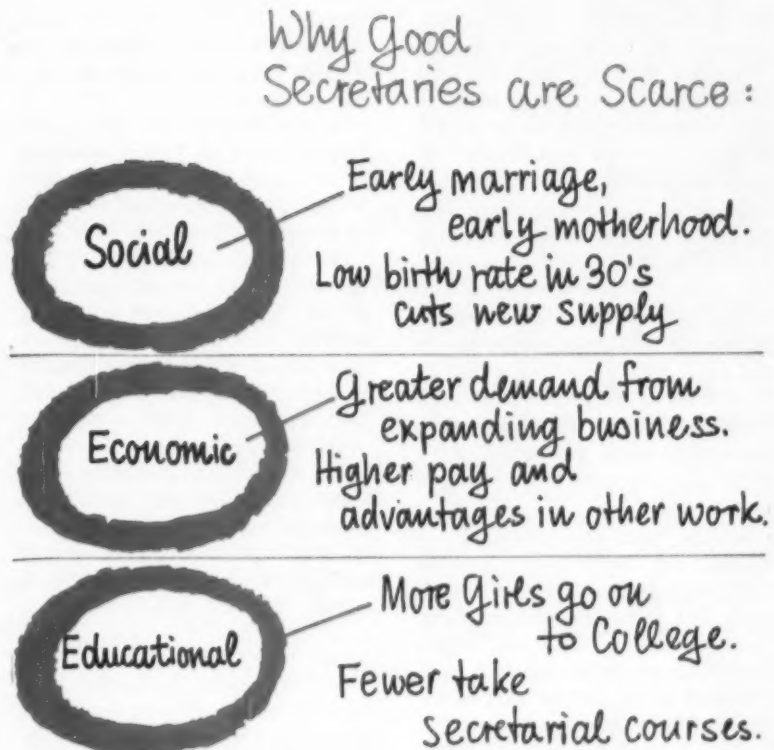
Lots of Jobs

Today, any girl high school graduate who is a competent typist has an opportunity for a good job in almost any metropolitan area. If she can take shorthand, she may find competition for her services. And no easing in the secretarial labor market is in sight.

These are the conclusions of a survey of 31 important areas of the country conducted by the Bureau of Employment Security of the U. S. Dept. of Labor. But they should come as no surprise if you are in contact with the personnel problems of your company.

There are three basic causes for the shortage of secretaries: changing social patterns, expansion of business and industry, and educational factors.

First, the lower birth rate of the 30's reduces the potential new labor supply, a factor in evidence for several years. This is accompanied by the trend to early mar-



riage and to early family formation. (According to census data, almost 35 pct of the 18-19 year old women are married. And it is estimated that over half of the first babies are born within a year after marriage.)

Second, industrial expansion and economic growth have increased the number of secretarial positions. Furthermore, other positions in industry pay more, or offer other advantages. Others, such as airline stewardess, provide glamor, travel, or other incentives not present in office work.

Third, educational patterns are changing. More of today's high school graduates are going to college. Fewer take secretarial

courses. And, while this is not a unanimous conclusion, there is some evidence that changes in educational methods are not equipping high school graduates to become competent secretaries.

Need Fundamentals

High school systems come in for some criticism, both in technical training and in basic education.

"High school graduates are average to good in mechanical operation, although they need experience and training," an office manager says. "Schools are not placing adequate emphasis on spelling and English. Some applicants are not qualified."

SELLING: Product Education Pays Off

Handling jobber and retail sales can be a headache . . . One firm is licking the problem using the sales truck approach . . . It finds this adds up to big sales jumps . . . Wider markets are covered—By G. G. Carr.

◆ YOU'VE PROBABLY been preaching and practicing the doctrine of the "hard sell" for some time now. And you have probably also been praying that some of your company's drive and enthusiasm is carrying over to your jobbers and distributors.

Handling jobber and retail sales is a traditional problem for manufacturers, with numerous complexities. Nichols Wire & Aluminum Co., Davenport, Iowa, found it had all the usual problems in the field, plus the added difficulty that most of its products (aluminum nails, chain wire fence, other aluminum wire products) were relative newcomers to the marketplace.

Lumber yard personnel, for example, are thoroughly familiar with steel nails and related products. But they are still learning about aluminum nails and other aluminum products. Product education is an important part of all Nichols' sales efforts.

Combine Objectives

To combine its two objectives of intensive selling and dealer education, Nichols uses an adaptation of the sales truck with remarkable success. Two trucks have been calling on jobbers and retailers around the country for over a year, and two more are planned for the near future.

Edward C. Manix, vice-president-sales for Nichols, reports that the trucks have proven themselves in five major sales areas: (1) Opening accounts with new jobbers; (2) showing both new and old jobbers how to sell Nichols products to retailers; (3) boosting sales to retailers; (4) showing retailers how to sell the products; (5) building repeat

sales both to and by jobbers and retailers.

A few examples spell out the dollars-and-cents effectiveness of the trucks' visits:

A Washington, D. C., jobber bought \$1512 of Nichols products in the year prior to truck visit. Within 2 months after the visit, he bought \$1720 worth.

An Atlanta jobber bought \$725 in the year before the truck called; 2 months later he bought \$5276 worth.

A Somerville, Mass., company had been doing \$1500 a quarter. Since the truck's visit, it has been doing \$4785 per quarter.

One company in Des Moines had handled \$14 worth of Nichols products in the full year prior to the truck's visit; within one month after the visit, it had bought \$782 worth.

Direct Sales

A Pawtucket, R. I., firm had done \$2897 in the year preceding the visit. Two months after the call, it had bought \$3977 worth of Nichols products.

While direct sales right off the truck are a secondary objective, the results in this area have been surprising: One jobber's retailer in New Jersey bought \$1139 from the truck in one call. In Illinois, a jobber and his customers took \$2553 in Nichols products from the truck.

Trucks carry Nichols products, display racks, promotional material and sales training kits. The drivers are specially selected and trained Nichols salesmen, who work with jobbers' salesmen on their visits.

To avoid legal complications, Nichols gets a letter of consignment from each jobber so that products sold off the truck are

handled as material on consignment to the jobber. Jobbers assign their own salesmen to ride with the trucks to ensure good reception and coverage of retailers. Nichols has found that jobbers should be given 4 to 6 weeks advance notice of the truck's visit. Visits run anywhere from a day to a week with any one jobber salesman, and it generally takes a minimum of 2 weeks to cover dealers in a given area. Trucks are restocked by shipping merchandise from the Davenport plant to jobbers' warehouses.

Nichols feels that one of the most important advantages of the truck calls lies in the number of dealer personnel that can be reached. Most calls are on lumber yards, and calls without the truck are usually confined to a purchasing agent or perhaps the owner. But the vast majority of goods sold in a lumber yard are handled and serviced by employees who can usually be classified as warehouse men. When a sales truck appears on the scene, the driver assembles as many yard employees as possible for a display and explanation of Nichols products.

Promotion Material

While in the yard, Nichols salesmen make sure their products are properly displayed. Decal transfers are used wherever possible. Nail kits and promotional literature are set up in prominent positions, and potato baking nail kits are passed out freely.

Truck visits are followed up by direct mail and a small plastic carpenter's square with an advertising message. But the best follow-up of all is the heightened sales effort by the jobber, who has been shown that Nichols products can be moved in volume.

PUERTO RICO: More Aluminum

Island's first aluminum extrusion mill to boost annual capacity from 3600 to 6000 tons . . . Part of the expansion aimed at Latin American market.



Operator at the panel of the hydraulic extrusion press is a good example of local labor who picked up his skill on-the-job.

♦ **COMMONWEALTH** Extrusion Corp., Puerto Rico's first aluminum extrusion mill, is planning an expansion aimed at boosting its capacity by 67 pct after only six months in operation. The goal on completion of the project is 1 million lb of aluminum extrusions per month.

Most of the new equipment will be designed for the manufacture of drawn tubing for furniture and radio-television antennae. The additional output, in part at least, will be used to tap the increasingly lucrative Latin American markets. At present all production goes to local industry or to the U. S.

Effect of the new capacity will not be realized immediately. But it is significant as an indication of the bright future outlook held by management for metalworking industry in Puerto Rico.

Output Climbs

The company began its operation in May 1955 faced with the necessity of hiring local labor which was almost 100 pct unskilled, and training them on-the-job. As late as September only 210,000 lbs of finished aluminum extrusions were shipped. However, according to H. W. Long, plant manager, production has risen by

about 50,000 lbs per month almost from the start. Labor turnover has been small and worker morale high. Most of the workers are reaching the point where they qualify as skilled labor. Mr. Long insists "it will only be a short time until the average work output level will be higher than mainland United States."

The mill occupies a 23,000 sq ft building with an additional 3600 sq ft of melting facilities. The machinery includes a 1400 ton hydraulic extrusion press, one of the largest pieces of equipment on the island.

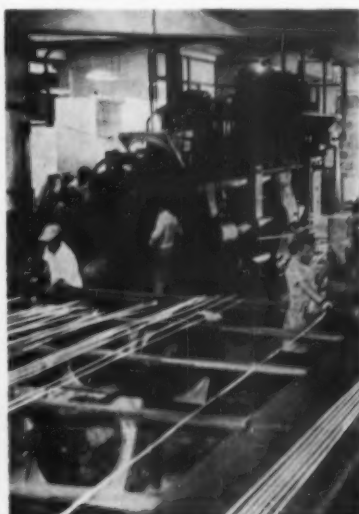
The fact that new organizations like Commonwealth Extrusion Corp. pay no local corporate income taxes for 10 years and are not subject to federal taxes has lured about 29 U. S. metalworking companies into starting branch plants here since 1949.

Metal products made on the



Molten aluminum is converted into extrusion ingots in casting machine.

island include nails, chain, fencing, automotive leaf springs, zip-pers and cigarette lighters. With the aluminum mill a success right from the start, the outlook is bright for more new industries in the future.



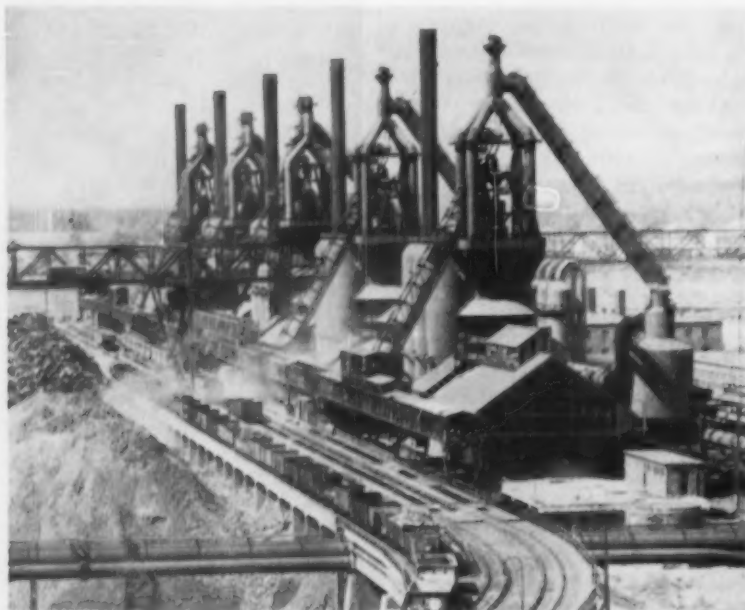
Freshly extruded sections come straight from presses to this runout table where they are sorted.



Workers who became skilled on-the-job feed extrusion billets or slugs into the hydraulic press.

STEEL: Austria Pushes Export Trade

Current home-grown steel buying spree is sparking quick Gov't action to boost exports . . . The nation needs dollars to help rebuild its shattered economy . . . Major metalworking plants are hard hit.



BLAST FURNACES such as these at Linz will be pushing hard to boost Austria's re-entry into the world steel market. New government steel export drive means stiffer competition for ECSC members.

◆ **NOT ALL AUSTRIANS** are waltzing to happy tunes these days.

The current home-grown buyers' spree for finished steel has put a serious crimp in the nation's dollar-earning export trade. And, it has sparked hard-headed government action aimed at boosting exports substantially.

Through its nationalized iron, steel, and coal enterprises, the government is telling big steel consumers that those who continue to neglect the export market will get little steel or other raw materials from government owned industries.

In a determined effort to drastically cut down on steel imports which are costing the nation

much-needed dollars, the government is limiting import licenses to the 1953-early '55 level when imports were low.

Measures Pay Off

These measures have already resulted in a snap-back in export business. Early last month, in competition with the European Coal & Steel Community, Austria began selling steel to foreign buyers.

The government-controlled steel industry will sell steel to foreign markets at a rate about equal to the 1953-early '55 level when exports were high—irrespective of the domestic supply situation.

Big domestic consumers which include tool makers, machinery manufacturers, electrical equip-

ment producers, and construction firms are pressing for all the steel they can get. The squeeze for finished steel has become so acute that exports during September and October fell off to almost nothing.

Two things are certain: Austrian steel prices won't be raised above the 1954 average, and Austria won't enter the ECSC. The nation's neutrality status puts a barrier between the ECSC and possible future admission to the European steel coalition.

Austria's boot-strap re-entry to the world steel market could prove an uncomfortable challenge to the ECSC, especially in the light of spiraling prices being charged for ECSC steel. Right now, Austria is buying some ECSC steel to meet its tremendous consumer demand. This means she's spending dollars instead of earning them, losing markets instead of developing them.

Reds Blight Plants

Meanwhile, the nation is struggling to rebuild its once-vital steel industry and economy. This entails a number of headaches.

Post-war Soviet mis-administration of such metalworking industries as Wiener Leichtmetallwerke (aluminum), Stahl & Temperguss (foundries), and Berndorfer Metallwarenfabrik A. Krupp (non ferrous metals) has left these plants in sad shape.

During Red rule, plant equipment was run down deliberately. Nothing was invested by the Communists in the way of new machinery or equipment. Result: three months after their return by the Reds, many once-modern plants look like bombed-out shells.

Long-sought foreign loans to help rebuild these industries haven't come through.

Aircraft:

Navy pushes plans for supersonic atom-driven seaplane.

Accelerated efforts are underway to get a supersonic, atom-driven seaplane into the air at the earliest possible time.

With contracts already placed for the fuselage of this plane, the Navy now wants action on the power plant. It intends to get this action from Allison Div. of General Motors, which will study the best way to produce a feasible nuclear engine. Next step will be development of an actual reactor.

New Type

One type of reactor has been flown in an Air Force B-36, but it supplied no propelling power to the aircraft. Instead, it provided a means for testing anti-radiation properties of a number of materials.

Atomic-plane fuselage projects are being conducted for the Navy by the Glenn L. Martin Co. and

the Convair Div., General Synamics Corp. General Electric Co., Pratt & Whitney, and Curtiss-Wright are working on Air Force atomic engine designs. Convair, Lockheed, and Boeing Airplane Co. are performing fuselage projects for the Air Force.

Set War Plan Talks

Industrial leaders in New England will meet with military planning officials in Boston, Jan. 10, to discuss production of materials needed by the armed forces in war.

The position of industry in national defense arrangements will be explored. Subjects to be discussed include lay-aways of productive equipment, preparedness measures for industry, and maintenance of an adequate base for turning out military goods.

R. C. Lanphier, Jr., Deputy Assistant Defense Secretary (Supply and Logistics), will make the keynote remarks. Formal briefings by the Pentagon blueprinters will be followed by question-and-answer periods.

DEFENSE

Melvin D. Peach, of the New England Council for Economic Development, in Boston, is handling preparations for industrial executives who plan to attend the meeting.

Navy Orders Jets

A \$100 million Navy order for jet fighters has gone to Chance-Vought Aircraft, Inc., Dallas, Tex. Order covers production of the F8U-1 Crusader, described as "the world's fastest Navy fighter."

First production model of the Crusader flew on Sept. 30; plane is now in production in the Dallas plant. It is powered by the afterburner-equipped Pratt & Whitney J-57-P12 turbo-jet.

In flight last March, an experimental prototype XF8U-1 exceeded the speed of sound in level flight.

Submarines:

New hull design will boost speed and range.

Faster underwater speed and greater range will be made possible by a new hull design for four submarines being built for the Navy as part of the fiscal 1956 ship construction program.

Three of the subs will be diesel-powered, and the fourth is to be propelled by atomic engines. Hull configuration for these vessels is to be shorter and less slender than that of previous attack submarines. This hull design was used in construction of the sub Albacore.

Electric Boat Div. of General Dynamics Corp. was assigned the job this fall of building the nuclear-propelled SSN-585, which will get the improved hull. This vessel will use a nuclear reactor built by Westinghouse Electric Corp. and is to give better underwater performance than the earlier atomic subs, such as the Nautilus.

Portsmouth, N. H., Naval Shipyard and the Ingalls, Shipbuilding Corp., Pascagoula, Miss., will each build one of the diesel-driven subs. Bids for construction of the third are still to be requested. These

vessels will have about the same displacement as earlier postwar subs, but will have a single screw peller propulsion. Overall, exterior silhouettes will be somewhat more radical than earlier models.



LOOKING AFT at Albacore's new fish-like hull design, latest for subs.



UP PERISCOPE as sub goes through test to determine hull efficiency.

EXPANSION IN INDUSTRY

Shipbuilding:

**Current and new orders
total about \$500 million.**

Shipbuilding will be heaving itself up from the business doldrums during the next six months, as domestic yards tackle about \$500 million in current and new orders.

U. S. Maritime Administration figures building, conversion and modernization of vessels now in progress are worth \$225 million. It estimates that some \$300 million worth of new business will be underway before next June 30.

Maritime Administration is generating more builder optimism with its efforts to have big ship operators start long-range replacement projects now. One 20 year modernization program was worked out with Moore-McCormack Lines.

Vessel design changes also offer added opportunities for new contracts. Commercial carriers are registering widespread support for trailerships and tell Maritime Administration they plan to build 35 of these vessels, each with ramp and hold facilities for scores of loaded truck trailers. The agency is hopeful that up to a dozen of these may be started before the end of June.

\$500 million:

**GE spending now totals
1 billion in half-decade.**

General Electric plans to spend \$500 million between now and 1958 for new facilities. This will bring total GE expansion spending from 1953 to 1958 to about \$1 bil-

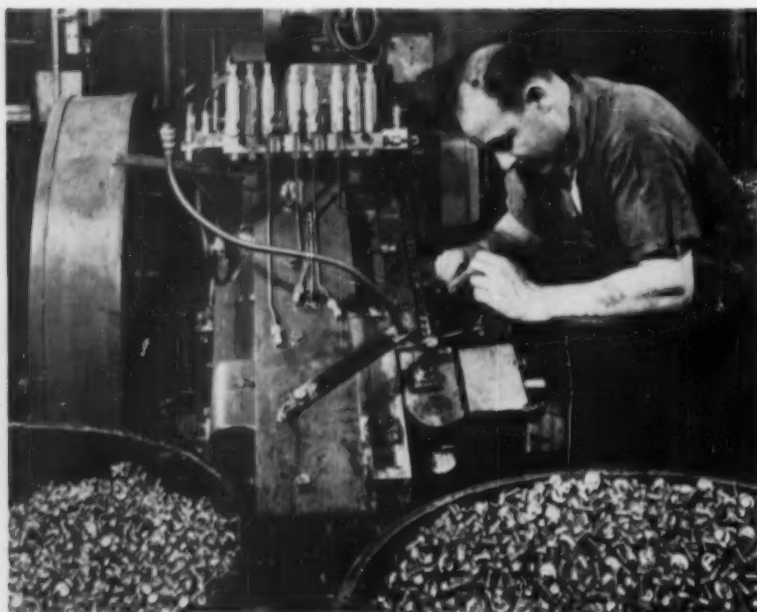
lion. Initial expenditures of \$175 million are planned in 1956.

Key factor in prompting the large outlay of funds is the sales record already predicted for 1956 by GE president Ralph J. Cordiner. Although GE expects sales in excess of \$3.1 billion this year, equalling or exceeding the best previous high, Mr. Cordiner predicts an increase next year of 10 or 15 pct.

Midvale-Heppenstall Co.??

Heppenstall Co., Pittsburgh steel forgings mfg., and Midvale Co., Philadelphia mfg. of heavy steel forgings are set to form a company which would be the nation's largest manufacturer of heavy forgings. The transaction which would see Heppenstall purchase all assets of Midvale now needs only approval by Midvale stockholders.

Total capacity of the new company would be in the vicinity of 300,000 tons annually. The Heppenstall Co. would retain its name and set up a new corporation, Midvale-Heppenstall Co., to operate the Midvale facilities. Heppenstall would hold all voting stock. \$2.5 million will be spent to renovate and alter the Midvale plant.



INDUSTRIAL fasteners industry looks for another good year in 1956. Unofficial prediction is that nut and bolt producers will use 2 pct of all steel next year, that output will expand 5 pct in first six months over present production levels.

Expansion Briefs

Midland Industrial Finishes Co., Waukegan, Ill.; new 1000 sq ft addition to its plant.

Continental Screw Co., mfg. metal cutting tools; New Bedford, Mass.; \$250,000 addition to plant to house newly developed machinery.

The Foxboro Co., Foxboro, Mass.; instrumentation; new building to double size of training and education center.



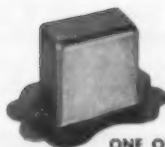
TWO OPERATIONS

Container of 18 gage 250 aluminum formed by redrawing a larger cup. Part size: $2\frac{1}{2}$ " dia. x $4\frac{1}{4}$ " deep.



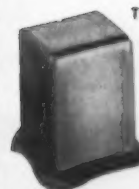
TWO OPERATIONS

Relay Cover of 0.025" 250 aluminum formed by redrawing a round cup into the final shape. Part size: $1\frac{3}{4}$ " x $2\frac{1}{4}$ " x $3\frac{3}{4}$ " deep, with $\frac{1}{8}$ " corner radius.



ONE OPERATION

Cover of 0.037" deep drawing steel. Size: $1\frac{1}{2}$ " x $2\frac{1}{2}$ " x $2\frac{3}{4}$ " deep, with $\frac{1}{4}$ " corner radius.



TWO OPERATIONS

Cover of 20 gage 250 aluminum formed by redrawing. Part size: $1\frac{3}{4}$ " x $1\frac{1}{2}$ " x $2\frac{1}{4}$ " deep, with $\frac{1}{8}$ " corner radius.

Shown above are typical parts produced by F. & B. Mfg. Co.'s Cincinnati 8" Hydroform. Shown at lower right are other interesting examples of 8" Hydroform work.

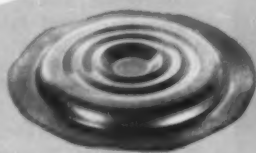
Cincinnati 8" Hydroform Brings New Economies To F.&B.

Equipped with the Cincinnati 8" Hydroform shown at right, F. & B. Mfg. Co., Chicago, Illinois, is producing deep drawn parts at costs substantially lower than previously possible using conventional presses. Manufacturers of *Filco* Automotive Ignition Equipment, and contract suppliers of drawn parts, F. & B. gives credit to the 8" Hydroform for greatly increasing the versatility and economy of their production. Now, formerly difficult short-run jobs are handled with ease, and experimental work is readily completed—all with exceptional time and tool cost savings.

If you do deep drawing, or can convert a portion of your component part production to drawn shapes, you can receive the same benefits from Hydroforming now enjoyed by F. & B. Let a Cincinnati Milling field engineer give you full details. New Bulletin M-1908—completely revised—gives a detailed description of Hydroforming and specifications of the 8", 12", 19", 23", 26" and 32" machine sizes. Write for your copy.



8" HYDROFORM
Max. draw depth, 5".



ONE OPERATION

Diaphragm of 0.005" stainless steel, $1\frac{1}{2}$ " dia. Extremely close tolerances held on part contours.



ONE OPERATION

Box of 0.010" 25 full hard aluminum. Part size: 2" square x $\frac{1}{4}$ " deep, with 0.030" corner radius.



Hydroform

PROCESS MACHINERY DIVISION

THE CINCINNATI MILLING MACHINE CO.
CINCINNATI 9, OHIO, U. S. A.

JAL-TREAD FLOORPLATE THE SHORTEST DISTANCE BETWEEN



The straight-line pattern of J&L Jal-Tread raised cleats plus the strength and toughness of high quality steel combine to provide floor plate with both safety and economy.

Whatever your application . . . in new construction, new equipment or replacement, you'll find Jal-Tread offers you the shortest way to:

Safe Footing—300 miniature squares per square foot—all of uniform height—provide maximum linear friction surface, protect against lost-time accidents.



Easy Fabrication—The Jal-Tread straight line pattern simplifies welding, flanging, shearing, bending, punching, and drilling operations. Experience shows that Jal-Tread can be cold-formed on standard plate-bending machines.

Easy Cleaning—The Jal-Tread straight line gutter pattern permits quick, thorough sweeping and draining in any direction.

For safe, long-lasting flooring always specify J&L Jal-Tread . . . it's available at leading distributors everywhere.

Jones & Laughlin
STEEL CORPORATION — Pittsburgh

PLANNING

Report to Management

Deadline March 15

It's not too early to start worrying about your business tax bill. Don't get so excited over the prospect of a tax cut next year that you lose sight of what you can save this year through proper study of your company's tax situation.

You are entitled to all you can save by legitimate methods of handling transactions. You are actually negligent if you don't take advantage of every honest method of cutting your company's tax bill.

First thing to do is make sure you retain a qualified tax expert or firm of tax specialists. And don't hold your tax consultations just once a year, but throughout the year as decisions come up. This is the elementary advice of the American Institute of Accountants. Here are some other factors the Institute says you should consider.

Watch that Depreciation

Make sure you make the right choice of depreciated method for capital goods or other assets you acquired during the year. Straight line depreciation is the simplest—dividing the cost less its anticipated trade-in or resale value by number of years of use. (Don't forget to deduct freight and installation charges.)

You may now choose other depreciation methods such as the declining balance method or similar ways which provide for larger depreciation in earlier years and declining depreciation in later years.

Fast depreciation helps out if you are making large outlays for new equipment. But this also results in less depreciation later in the equipment's life. Before choosing, make a careful estimate of future earnings. That's the big factor in depreciation choice.

Your Option on Research

If you are making substantial expenditures on research and development, you have an impor-

tant alternative there. These costs can be treated as immediately deductible as expenses or amortized over a period of years.

"A bird in the hand"

is what the AIA calls the immediate deduction method. This will help out a lot if your company really needs the tax benefit this year to help pay for the outlay.

But if you are in a position to spread the cost over a period of years, that may be the thing to do. This is particularly true if your company's earning position is solid and earnings are expected to gain steadily over the years.

If You're Making Repairs

There's a difference between repairs and improvements. Be sure they are listed separately. If you don't, the entire cost may be capitalized for future depreciation. If you list repairs separately, you can deduct their cost as an expense of the current year.

You also have a choice of fiscal year dates. Best advice here is to choose the fiscal year that corresponds most closely with your company's business cycle. But watch a change carefully. It's possible that it might result in adverse tax effects if improperly timed.

What's Your Executive Pay?

Executives didn't get salary raises proportionate to those they granted their hourly workers in the past year. In the 1954-55 fiscal year, high ranking executives gained compensation increases of 1.8 pct compared with 5 pct for hourly workers in manufacturing.

Executives suffered from bonus reductions that tended to occur during 1954 because of the relatively poor business year, accounting for the lag in gain in total compensation, the American Management Assn. says.

INDUSTRIAL BRIEFS

True Blue . . . Allegheny Ludlum Steel Corp. is distributing a new blue data sheet on stainless steel type 301. An austenitic steel with a nominal composition of 17 pct chromium and 7 pct nickel, it is used primarily in structural applications, automobile trim, show cases, stove fronts, and cooking utensils.

Keep 'Em Rolling . . . Heavy orders from railroads during the last quarter of 1955 will send the nation's freight car builders into the new year with one of the heaviest backlogs in history, according to Lester N. Selig, president, American Railway Car Institute.

Millions For Power . . . Temco Aircraft Corp. has been awarded a multi-million dollar contract to manufacture power packs for the Air Force's C-123B Provider assault transport.

For Good Conduct . . . A silver clad steel plaque was placed on a railroad tank car to commemorate the 25th anniversary of the production of clad steels by Lukens Steel Co., Coatesville, Pa., first producers of clad steel plate for commercial purposes in 1930.

Another Branch Office . . . The Morgan Engineering Co., Alliance, O., is opening an office in Canfield, Ohio.

Place Your Bets . . . Chance Vought Aircraft has called for bids on a new \$3.5 million high speed wind tunnel to expand its aerodynamic testing facilities. Scheduled for completion in 1958, models will be expected to make airspeeds equivalent to 3,800 miles an hour. Company is now operating a low speed tunnel which provides winds up to 200 mph with the test data valid up to 500 mph.

Pending Approval . . . Mullins Manufacturing Corp., producer of Youngstown kitchens, and the American Radiator and Standard Sanitary Corp., have made merger plans pending stockholders' approval.

Over the Top . . . Etna plant of The National Supply Co., Pittsburgh, Pa., has achieved the largest single month's shipping record in 127 years of company operation. During November the plant shipped 27,280 tons of welded steel pipe and electrical conduit.

Bundles and Turnings . . . The Burgin Steel Co., Cleveland, has been formed by Manly R. Burgin to buy and sell iron and steel scrap.

Yes, Virginia . . . Christmas buying is expected to push total retail sales for 1955 to a new high of at least \$185 billion, \$15 billion more than last year, according to the U. S. Chamber of Commerce.

New Distributor . . . Roll Formed Products Co., Youngstown, O., manufacturers of continuously rolled metal shapes, has appointed The Fehlenberg Co., St. Louis, Mo., to represent the firm in the central Mississippi Valley states.

Equations Solved . . . The University of Wisconsin will build an \$800,000 addition to house the mathematics research center of the U. S. Army. The general objective of the center, according to the Army, is to provide a nucleus of highly qualified mathematicians who will carry on investigations of interest to the Army, aid the national effort in mathematics research and increase the availability of trained mathematicians.

New Chapter . . . William S. Story is joining the staff of the Institute of Scrap Iron & Steel Inc., as director of public relations.

Blimey . . . British Metalworking Industry union management representatives visiting their counterpart in the United States were surprised at the few workers necessary to operate machines in American factories as compared to Britain, according to Mark J. Fitzgerald, C.S.C. in his book, "Britain Views Our Industrial Relations."

Cash and Carry . . . All assets of the Tracto-Lift Co., Kansas City, Mo., manufacturers of fork lift trucks, have been purchased by Ottawa Div. of L. A. Young Spring & Wire Corp.

Pipe and Tubing . . . Specifications for Nickel-Chromium-Iron Alloy Seamless Pipe and Tubing, H34.3-1955 (ASTM B167-49T), have become the 1500 standard to be approved by the American Standards Assn. This is double the number in national use as late as 1948.

Includes Russian Reactors . . . Raytheon Manufacturing Co. has published "Nuclear Reactor Data," a booklet listing all significant data on every nuclear reactor which is known to be already built or under construction anywhere in the world, including six in Russia. These characteristics include charts and information on the function, builder, location, and important technical features of the reactors.

That's Progress . . . Tube Manifold Corp. of Buffalo increased its manufacturing space 300 pct by purchase of the former plant of Adasco Industries Inc. in North Tonawanda for about \$500,000.

Barium raises its sights again!

Merger of steel operations to step up efficiency, increase customer service

Another milestone in Barium's long-term policy of planned integration was reached recently with the consolidation of all steel-making operations under the management of Barium subsidiary Phoenix Iron & Steel Company, Phoenixville, Pa.

Aimed at improving efficiencies still further and broadening Barium's customer service, the consolidation integrates Central Iron & Steel Company, Harrisburg, Pa. (now known as Plate Division), Chester Blast Furnace, Inc., Chester, Pa. (now known as Blast Furnace Division), Structural Division, Phoenixville, Pa. and Phoenix Steel Tube Division, Phoenixville, Pa. (Seamless Tubing), under

the management of Phoenix Iron & Steel Company. All now function as Operating Divisions, and will remain in their present locations.

Barium believes this merger will produce a stronger and more flexible operation and set the stage for accelerated growth—not only of the divisions directly involved, but also of the entire Barium organization. For this move is a practical demonstration of the alert management thinking which has expanded Barium from one company to 14 in ten short years. Find out about Barium's soundly diversified family of companies. Write for "The Barium Story." Barium Steel Corporation, 25 Broad Street, N. Y. 4, N. Y.

STEEL PRODUCERS

Phoenix Iron & Steel Co. (Plate Div.; Structural Div.; Steel Tube Div.; Blast Furnace Div.).

STEEL FABRICATORS & PROCESSORS

Phoenix Bridge Company • Industrial Forge & Steel, Inc. Globe Forge, Inc. • The Geometric Stamping Company

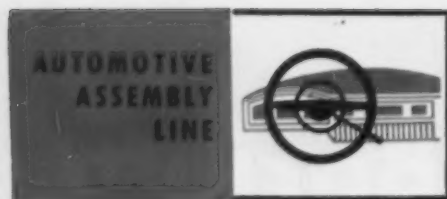
MANUFACTURERS OF END PRODUCTS

Clyde Iron Works, Inc. • Erie Bolt & Nut Company
Bayonne Bolt Corporation • The Cuyahoga Spring Company • Jacobs Aircraft Engine Company • Kermath Manufacturing Company • Kermath (Canada) Limited
Wiley Manufacturing Company.

LIGHTWEIGHT METAL AND PLASTICS

East Coast Aeronautics, Inc.





Why Automakers Sing December Blues

Sales slump has some of the industry in a panic . . . But there are sound reasons why seasonal drop in sales may not be serious . . . Low inventory will keep steel demand up . . . AMC report—By T. L. Carry.

♦ **CUSTOMERS** just don't love the auto industry in December as they did in May.

Opinion is divided on whether the current sales slump in new cars is a temporary thing or a definite indication that the new car market is beginning to soften up.

Here are the facts in the case. New car sales did decline last month. Unofficial estimates placed new car stocks at the end of November at a little over 637,000 compared to 436,000 for the end of October. The increase in inventory averaged out to about 30 days supply.

It's Happening in Britain, Too

♦ **CAR DEALERS** in Britain are worrying too. There are more new automobiles in the showrooms and fewer buyers than at any time since the war.

The weeks before Christmas are not normally the best to sell cars, and recent increase in the purchase tax to 60 pct did not help.

Buyers wanting to purchase small cars still have to wait for delivery, but there has been a big falling off in the call for medium sized cars, family models included.

Makers are not unduly worried yet, but they are also concerned over the government's credit squeeze which has made the middle income buyer unable or unwilling to find the cash.

Rise in purchase tax meant a rise of about 60 pounds sterling in the cost of the most inexpen-

Chevrolet is cutting its December production 5 pct and Chrysler Corp. has gone back to a 5-day week. Ford has not announced a cut in its scheduling.

There are several explanations in the drop in car sales last month. Biggest reason is the record cleanup job performed by dealers in September and October to make way for the new models. Everyone will agree that there was an unusual number of 1955 cars on hand and the cleanup job was a tremendous one. It is possible that many people bought cars at that time who ordinarily would have purchased them later.

sive cars and over 1120 pounds sterling on the most expensive models. This has tended to increase the demand for smaller cars at the expense of medium priced.

Export in cars is holding up well, but there is some difficulty because of the restriction of the Australian market, and at home British manufacturers are conscious of increased imports, not to mention German scooters.

On the commercial vehicle side, the picture is brighter. Flourishing industry in Britain and most countries of the world is creating a demand for more commercial vehicles. There has been an increase of more than 30 pct in the production of commercial vehicles this year compared with a 20 pct increase in passenger cars.

November Slow . . . At the same time, November is traditionally a bad month for sales because people are spending their money for Christmas. Compared to 1954, November's sales were good.

On the other hand, if the slump is more than temporary, there are plenty of reasons for that.

It is suggested that sales for the whole 1955 model run were just too good to be true. The number of cars sold robbed the industry of many of what normally would have been 1956 prospects. Furthermore, the loose credit practices that became so rampant may keep prospects out of the market.

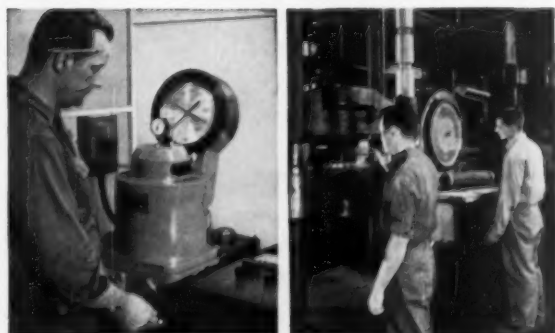
Minor Changes . . . In addition, there is not a radical change in the looks of cars from 1955 to 1956 and some potential customers who may be inclined to buy cars now are going to wait until 1957 to see what changes are made. It is true that, with the exception of Lincoln, Studebaker and the Rambler, 1956 is a facelift year.

However that may be, any cutbacks that are planned by the automakers are not in evidence yet at the steel producers level. Chances are that if there is a slump it won't be felt at the mills until after March. Biggest reason for this is the lack of sufficient inventory.

In addition, observers in Detroit who are predicting a permanent sales decline readily admit that it won't be much more than 10 pct. By 1955 standards a drop of 10 pct would mean 7,200,000 cars instead of 8 million.



How Great Lakes Steel *sprays* for quality



Left: The Olson Ductility Test is performed in one of the metallurgic laboratories. Right: A tensile test is made at the Quality Control Department's main lab. These are two of many checks to assure correct grain and hardness.



Quality of product and complete service to the customer are behind every sheet, coil and bar from Great Lakes Steel.

Our customers control this water!

Why? Because our customers' specifications determine the temper and grain structure of each shipment. These are achieved, in part, through control of the water that hits the red-hot strip as it races from Great Lakes' 96-inch continuous mill.

Temper and grain structure are among the many characteristics of steel strip and sheets that can make your production efficient and your product profitable. That's why the steel you order is so important to you—why your order at Great Lakes receives individual supervision *through every stage of production.*

Our knowledge of steel and steelmaking may be able to contribute importantly to your production and your product. A call will bring a Great Lakes representative to talk over your requirements.

GREAT LAKES STEEL CORPORATION

Ecorse, Detroit 29, Michigan • A Unit of



District Sales Offices: Boston, Chicago, Cincinnati, Cleveland, Grand Rapids, Houston, Indianapolis, Lansing, Los Angeles, New York City, Philadelphia, Pittsburgh, Rochester, St. Louis, San Francisco, Toledo, Toronto.



"I'm never
'Small Fry'..."

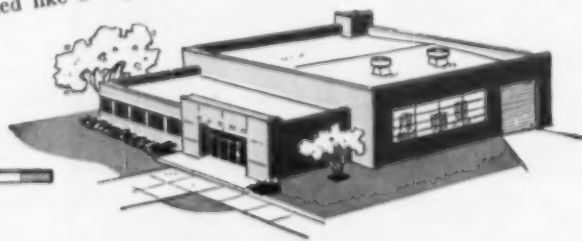
**when I do business
with Lamson & Sessions"**

"I've found no difference between a GOOD customer and a BIG customer at Lamson & Sessions.

Sure they have large volume buyers who perhaps require more service, more time and more help than I do. But I, too, enjoy the same wholehearted cooperation of Lamson's salesmen whose only incentive is to satisfy the customer regardless of size. To them *EVERY* customer is a *GOOD* customer.

These men give me many "extras" that seem to be as much a part of Lamson's business as the bolts, nuts and screws themselves. Engineering help, quick delivery, one source buying, pleasant congenial people... all these are the advantages I enjoy when I do business with them. In fact, I wouldn't be surprised if Lamson's leadership in the industry has been built on these "extras".

Yep, it's nice to be treated like a "big shot" even when my orders are small!"



YOU GET MORE WHEN YOU BUY FROM...

The **LAMSON & SESSIONS Co.**

1971 West 85th St. • Cleveland 2, Ohio

CLEVELAND AND KENT, OHIO • BIRMINGHAM • CHICAGO



Automotive Production

(U. S. and Canada Combined)

WEEK ENDING	CARS	TRUCKS
Dec. 17, 1955	176,712	27,479
Dec. 19, 1955	184,831	28,730
Dec. 18, 1954	157,245	22,605
Dec. 11, 1954	153,295	22,779

*Estimated Source: Ward's Reports

Financial:

American Motors in red, sees black.

Although American Motors Corp. is going to report a net loss in its annual statement this year, the company has been operating in the black since last February. According to George Romney, youthful president of AMC, its position will be improved substantially next year.

AMC's net loss for the fiscal year ending Sept. 30 this year was \$6,956,425 after a tax recovery of \$9,700,000. This compares with a loss of \$11,071,237 in 1954 after a tax recovery of \$11,590,000.

According to Mr. Romney, 85 pct of this year's loss is due to unusual expenses involved in the merger of Nash and Hudson, low production after the merger, and the late introduction of 1955 models.

New Lines Coming

Despite all the headaches involved in the merger, sales for the 1955 model run totalled 153,522 cars, an increase of 34.7 pct over 1954. Rambler production alone was up 140 pct.

Looking ahead, Mr. Romney says that the company won't be able to capitalize fully on the merger until a complete new line of products has been introduced.

As a result, it will be another year before the merger begins to pay off substantially. For 1957, the company is planning completely new Hudson and Nash cars.

In addition, AMC will start making some of its own V-8 engines at Kenosha, Wis. in February. Present plans call for using the engine in the Nash Statesman and Hudson Wasp. Previously, the

company had to buy all its V-8s from Packard. Although it will still buy some, it is hoped that eventually the purchases will be unnecessary.

Safety:

Ford and GM differ on promotion approach.

Safety controversy, which has gone on in the auto industry for years, has become even more pronounced since the introduction of the 1956 cars.

The programs adopted by some auto producers have split the industry right down the middle. Ford is currently exploiting its lifeguard design and General Motors counters with the statement that it has always built safety into its cars without a lot of fanfare.

General Motors feeling on the subject is that it is better to build safety into the car without calling it to the public's attention for commercial purposes. The big unknown, GM claims, is the driver of the car.

AUTOMOTIVE NEWS

Ford on the other hand, although claiming not to be primarily interested in safety as a selling point, believes that seat belts, padding and dish-type steering wheels actually help prevent serious injury in case of accident and in some cases save lives.

It is possible that both companies are right. Surveys show that, although it is a good idea to "package the passenger," it is equally as good to promote effective driver education programs to help prevent traffic accidents.

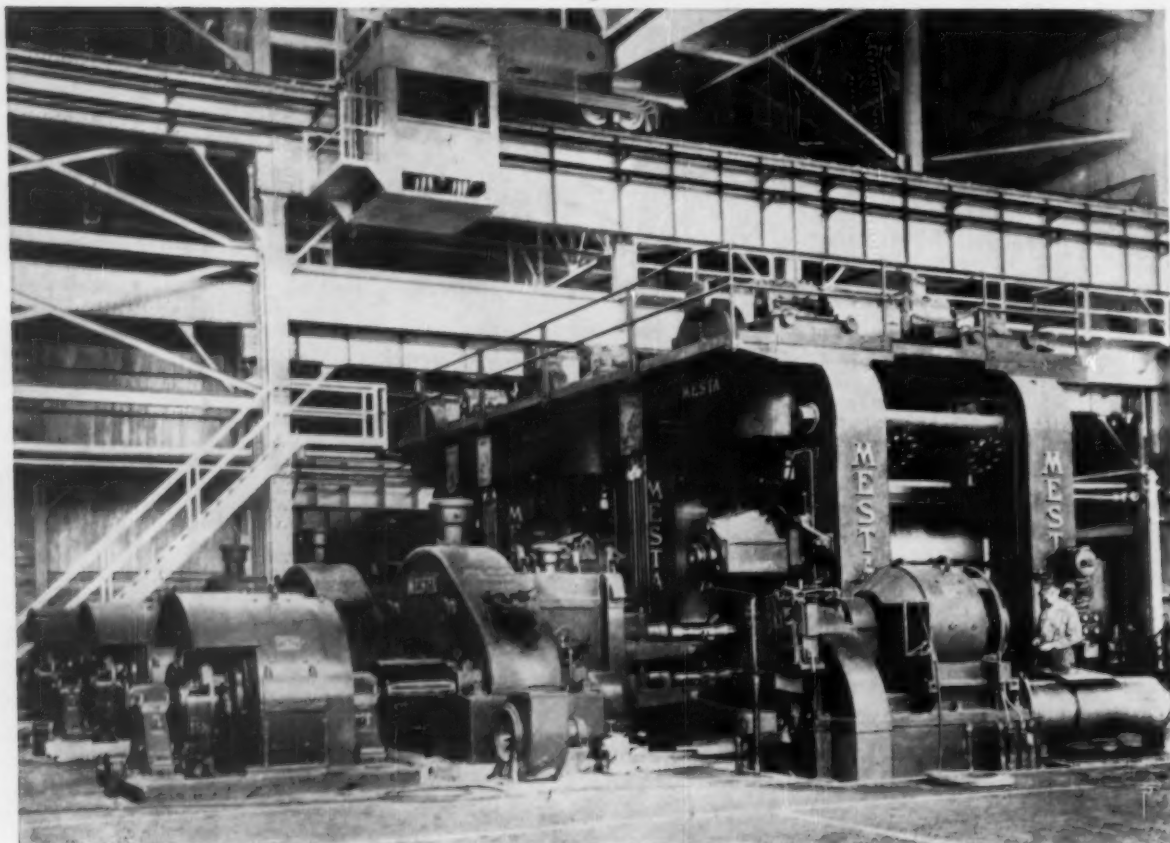
It is true that seat belts and other equipment are of no help in certain types of crashes.

The only way the public can be made aware of the advantages is through advertising on a wide scale. Nash had the unfortunate experience of offering seat belts on its cars a few years ago and they were a total flop because the public had not been educated to their advantages.

THE BULL OF THE WOODS

By J. R. Williams





Polar additives assure better gear and bearing protection

ONE of the "musts" for an effective enclosed-gear lubricant is ability to cling to metal under adverse operating conditions. *Texaco Meropa Lubricant* contains polar additives which cause it to adhere tenaciously to gears under *all* conditions—even when immersed in water.

But this is only one of the reasons for the superiority of *Texaco Meropa Lubricant*. Some others—

1) High Load carrying capacity: The extreme pressure properties of *Texaco Meropa Lubricant* toughen its lubricating film so that it withstands shocks and heavy duty steady loads far in excess of manufacturers' requirements for gears and bearings. Moreover, these EP properties outlast those of other lubricants.

2) Resistance to thickening and foaming: *Texaco Meropa Lubricant* effectively resists the heat-induced thickening that is normal with all lubricants. It will not foam.

3) Great stability: *Texaco Meropa Lubricant* will not separate in use, storage or centrifuging.

4) Non-corrosive: *Texaco Meropa Lubricant* will not corrode any of the metals used in gears and bearings.

Let a Texaco Lubrication Engineer give you full information. Just call the nearest of the more than 2,000 Texaco Distributing Plants in the 48 States, or write:

☆ ☆ ☆

The Texas Company, 135 East 42nd Street, New York 17, N. Y.



TEXACO Meropa Lubricants

FOR STEEL MILL GEAR DRIVES

TUNE IN: TEXACO STAR THEATER starring JIMMY DURANTE on TV Sat. nights. METROPOLITAN OPERA radio broadcasts Sat. afternoons.



How Tax Cuts Are Shaping Up

Both parties map plans for slash . . . Dependant exemption will be raised to \$700 . . . Rates for lower income groups will go down . . . But no cut in corporate levies is likely—By G. H. Baker.

◆ **TAX CUTS** for individuals have been tagged with a No. 1 priority by both Democrat and Republican party leaders, but the prospect for reductions in the corporation income tax rate is very slight.

In fact, some political leaders confide that nothing short of a major depression (which nobody now expects) could produce tax relief in 1956 for incorporated business.

As far as individuals are concerned, the cuts probably will come about via the route of higher exemptions.

Keep Plans Secret . . . Neither party is ready to tip its tax-cut plans just yet, but the word from the inner offices at the Capitol is that the current \$600 exemption for each taxpayer and dependent is to be raised to \$700. In addition, there may well be some easing in the rates for the lower- and middle-income groups.

Those who make less than \$5,000 a year probably will get a substantial rate cut. Those in the \$5000-\$7500 range probably will get a smaller reduction. For those in the \$10,000-plus bracket, there's little or no rate reduction in sight.

Trucks Will Roll . . . Trucking industry, flush with volume business and plump income, looks forward to another good year of business in 1956.

Upward trend will very likely continue for several more years, says Neil J. Curry, the chairman of the American Trucking Associations.

Truckers, in addition to sharing

in total U. S. business prosperity, are registering impressive gains in their own industry—partly at the expense of competitive forms of transport, especially railroads.

Taste Shift Helps . . . Mr. Curry points out that the shift in U. S. eating habits to more fresh foods and types of foods—requiring the speed and flexibility of motor transport—has boosted the volume of truck tonnage significantly.

Portion of the consumer's food transport dollar spent for trucking has risen from 25 cents to 50 cents since 1935. Trend is still up. More and more people are demanding fresh foods.

Lines Stay Down . . . A telephone engineer who spent more than a year in Washington plugging up channels of communication has finally quit, but there's no immediate sign that the net of

censorship he built will be cut any time soon.

In fact, Defense Sec. Charles E. Wilson says glowingly that R. Karl Honaman, the telephone expert, made a "substantial contribution" by shutting off the flow of Army, Navy, and Air Force news to the press and to the public.

More and more congressmen—both Democrats and Republicans—are disturbed at the curtain of silence ordered erected by Sec. Wilson.

To keep military secrets from an enemy is one thing; to kill legitimate news on the flimsy ground that it "does not contribute to the dignity" of the Pentagon hierarchy is something far removed from the area of national security.

As a result, Congress is getting ready to exercise its right to have the final say on the matter.

The Country Has Been Good To Us . . .

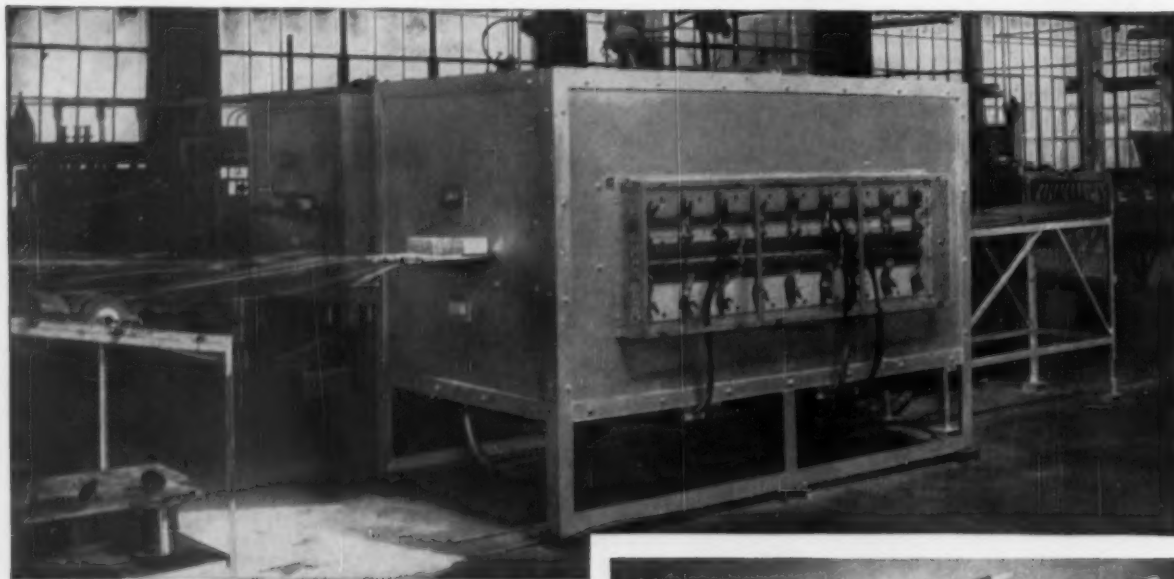
■ **Maurice H. Stans** recently joined the Eisenhower Team as Deputy Postmaster General. Here's how he "profited":

In accepting the \$17,500-a-year sub-Cabinet post, Mr. Stans took an 80 pct salary cut. He resigned from the boards of six corporations; he quit as executive partner of Alexander Grant & Co. (accountants), and to avoid any suggestion of "conflict of interest," the Post Office cancelled its management contract with the firm. He also had the expense of moving his family from Chicago to Washington.

Despite all this, Mr. Stans feels strongly that his new post is in no way a personal sacrifice. He says:

"My father was an immigrant; my mother's father was an immigrant. The country has been good to us, and I believe we owe it a lot more than merely paying taxes."

More proof that "HOT RODS" last 3 times longer



Completely Equipped With "Hot Rods" after Norton CRYSTOLON heating elements proved their ability to outlast others 3 to 1. This electric furnace is one of a battery operated by the Alloy Metal Wire Division of H. K. Porter Company, Inc. of Prospect Park, Pa., for bright annealing alloy wire at 2150F. Heating elements operate in an air atmosphere, while the wire passes through tubes containing a controlled split-ammonia atmosphere. These furnaces idle at 1700F-1750F on weekends and holidays, no element service is continuous.

Alloy Metal Wire Division H. K. Porter Company, Inc. converts to CRYSTOLON* heating elements after tests prove superiority of latest Norton R

Like many another new user of "Hot Rods" the Alloy Metal Wire Division of H. K. Porter Company, Inc. found that these Norton CRYSTOLON heating elements last much longer. Here is a summary of the tests responsible for this company's decision to make a complete change-over to "Hot Rods."

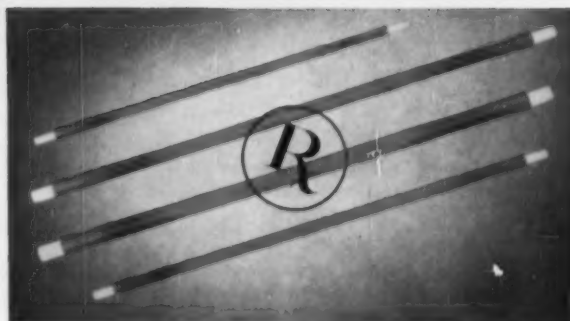
Electric furnaces at the company's Prospect Park plant are used for bright annealing alloy wire at 2150F. Previous heating elements had given approximately 4 to 6 months service with 3,048 hours as the best recorded service life. Then, in a furnace completely equipped with "Hot Rods" the Norton elements averaged 18 months of continuous service — or over 13,000

hours per element. Once again "Hot Rods" proved their ability to outlast competitive elements — by better than 3 to 1!

But that's not the whole economy-story. The much longer life of "Hot Rods" also means savings in element costs, because fewer "Hot Rods" are needed — plus reduced maintenance, due to less frequent changing — plus fewer changes in voltage taps — plus a smoother production flow.

Put these advantages to work for YOU

in your own electric furnaces or kilns. The big illustrated booklet, *Norton Heating Elements*, gives complete details



Norton CRYSTOLON Heating Elements, or "Hot Rods", are a typical Norton R — an expertly engineered refractory prescription for greater efficiency and economy in electric kiln and furnace operation. Made of self-bonded silicon carbide, each rod has a central hot zone and cold ends. Aluminum-sprayed tips and metal-impregnated ends minimize resistance and power loss. Available in standard sizes,

on how this proved Norton R cuts operating and maintenance costs. For your copy, write to NORTON COMPANY, 211 New Bond Street, Worcester 6, Mass.

NORTON
REFRACTORIES

Engineered... **R**... Prescribed

*Making better products...
to make your products better*

*Trade-Mark Reg. U. S. Pat. Off. and Foreign Countries

Export Credits

Government - backed export credits totaling \$25 million have been approved by the Export-Import Bank of Washington in another move to stimulate foreign purchase of modern machinery and equipment in the United States.

The credits being extended include the following:

American & Foreign Power Co., Inc., Mexico, purchase of U. S. machinery, equipment, and services in connection with a \$39 million electric power program, \$23,033,000.

Combustion Engineering, Inc., New York City, complete boiler unit to Spain, \$582,500.

Grinnell Corp., Providence, R. I., fabricated industrial piping, fittings and supports, \$300,000.

LeTourneau - Westinghouse Co., Peoria, Ill., tractor and implements to Egypt, \$150,000.

Harnischfeger Corp., Milwaukee, shovels to Turkey, \$137,500.

Bucyrus-Erie Co., South Milwaukee, excavators and related equipment to Mexico, \$135,000.

Minneapolis-Moline Co., Minneapolis, tractors and implements to Uruguay, \$110,000.

See Sale Okayed

Congress probably will accept the arrangements negotiated between General Services Administration and United Engineering and Foundry Co. for sale of a government - owned foundry at Newcastle, Pa.

Contract, according to Rep. Frank M. Clark, D., Pa., calls for United to pay \$7,750,000 for the foundry: \$500,000 down, and the remainder over 20 years at 3 pct interest to the government. Rep. Clark says he has been assured of congressional approval of the sale terms.

Foundry, built during World War II at a cost of \$23,000,000 and last appraised at \$14 million, has been operated for the last 13 years by United under a leasing arrangement. The facility, which represents about 40 pct of the heavy casting capacity of the country, has been closed down for several months during negotiations between United and GSA.

GSA will sell the plant under

the National Security Act, which requires the buyer to keep it in condition to be taken over again by the government in an emergency. GSA turned down a bid by United to continue its lease.

Competitive bids were taken on the facility, and contract details negotiated later with the high bidder, United.

Safety:

**Programs pay off
in big injury rate drop.**

Most industries are improving their employee safety programs and driving the injury-frequency rates down to new low levels, latest statistics from the U. S. Labor Dept. disclose.

Figures for 1954 show the average rate for manufacturing categories fell to 11.9 disabling injuries per million worker-hours. This was well under the previous record low of 13.4, set in 1953.

Improvements were greatest in the ordnance field, where the rate was reduced by 25 pct; primary metals, 17 pct; nonelectrical machinery, 16 pct; and paper, 16 pct. However, the jewelry, silverware, and plated ware industry experienced a 25 pct increase, and nine

WASHINGTON NEWS

other manufacturing groups had increases of 5 pct or more.

Carmaking Safe

In the nonmanufacturing category, construction injuries were at a new low for the fourth successive year, and telephone communication held its position as the industry with the safest rate—1 injury per million manhours worked.

Most favorable reports from the manufacturing groups included those from the synthetic rubber industry, with a 1.6 rate; explosives, 2.8; aircraft construction, 3.2; motor vehicle, 4.1; and blast furnaces and steel mills, 4.3.

Best rates in the nonmanufacturing field, besides the telephone communication figure, were turned in by banks.

Sun Snarls Radios

Government radio experts are warning industrial users of interplant radio networks that interference caused by sunspots is going to get worse in the next two years.

To correct difficulty, they are advising users of industrial radio to switch their transmissions to the higher frequencies.

Interference is getting to be more and more of a problem in the 25 to 50 megacycle band, which carries most radio transmissions originated by industry and police stations. The Federal Communications Commission reports that some industrial and police transmitters are going to be forced to shut down for "hours at a time" as the cycle of sunspots becomes more advanced.

The ability of the upper layer of the ionosphere to reflect frequencies in the 25-50 mc range undergoes irregular cycles of about 11 years. The 11-year peak will be reached during the winter of 1957-1958, and will be similar to the 1937-1938 maximum.

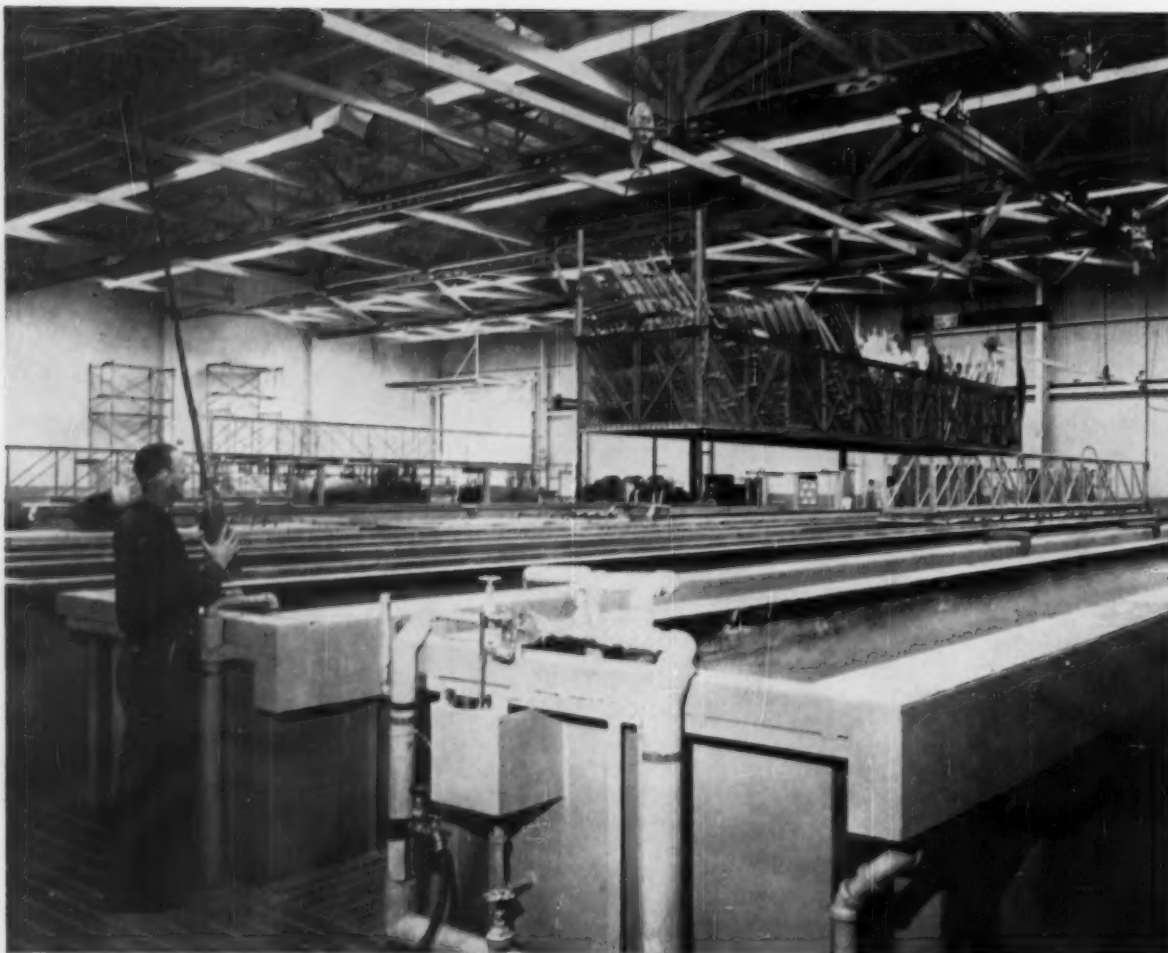
For detailed advice, write The Secretary, Federal Communications Commission.

Indian Sign On Industry

■ Navajo Indians, following a grim pow-wow on the poor state of the tourist business, are opening a major campaign to attract industry to their huge Western reservation.

Tribal council of the ancient Americans voted a \$300,000 fund to be spent on purchase of industrial sites, training workers, and publicizing the program. The Indians want their people to work for "something lasting, in contrast to a handout (from the government) which lasts only a few days."

The reservation lies in parts of Arizona, New Mexico, Colorado, and Utah. They want industry which will employ sizable numbers of the tribe to locate in the area.



Alodizing at Boeing is done in a series of 80 ft. dipping tanks. Each takes 76 ft. spars and whole B-52 wing panels.

BOEING ESTIMATES SAVINGS OF MORE THAN \$300,000 A YEAR OVER ANODIZING BY ALODIZING WITH ALODINE®

**ACP chemical conversion process cuts treatment time
by 33%, provides more uniform anticorrosion coating**

The Alodizing process takes little more than an hour to uniformly coat a batch of aluminum parts—and when dry they are ready for painting.

Savings through reduced costs of heat, water, power, compressed air, labor, and process time are estimated at \$300,000 annually. And there's another important saving: a scratch in the chemical coating can be quickly and easily repaired, in contrast with a damaged anodic

coating, which requires costly stripping and replating.

Another tangible, but inestimable, saving is the result of the technical assistance offered by ACP. Our Engineering and Service Departments worked closely with Boeing in recommending the right equipment, training personnel in the simple operation of the process, and checking samples of the finished product in our Quality Control Laboratory.

We can do the same for you. Write for the complete story of Alodizing with Alodine.

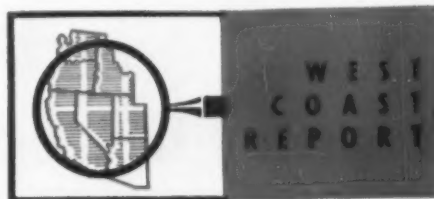
AMERICAN CHEMICAL PAINT COMPANY, Ambler 20, Pa.

DETROIT, MICHIGAN

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WINDSOR, ONTARIO





What's the Outlook for Seattle?

Seattle's metalworking industry will have plenty of work through next year . . . Large-scale Boeing military and commercial contracts will help firm up area's economy . . . Northwest still has growing pains—By R. R. Kay.

◆ **SEATTLE'S METALWORKING INDUSTRY** will be plenty busy right through 1956. Why?

Boeing Airplane Co. is sitting pretty with \$1.5 billion in military orders, plus \$300 million in new commercial 707-jetliner contracts. That's real good news for metalworking in metropolitan Seattle. Outside manufacturers produce 54 pct by weight of Boeing's B-52's. The new commercial orders mean steady work for many years—will tend to firm up the area's economy.

Seattle will become even more heavily dependent on the Boeing paycheck. Today's employment is 40,000. Although its Bomarc guided-missile plant is going to Wichita, Kan., the company is building up to a huge Seattle expansion program. First step: purchase of 40 acres adjoining its present facilities.

Shipyard Outlook Good . . . There'll be work for the giant Puget Sound Naval Shipyard, Bremerton, Wash. Jobs on the way: two missile frigates, sister ships of USS Boston and Canberra. The yard will keep 12,200 workers busy. That's the latest word from the Navy.

And a \$30 million to \$45 million drydock to handle Forrestal-class aircraft carriers may be built here. The Navy awarded an advance-planning contract for the project.

No Fish Story . . . What's the connection between West Coast metalworking industry and a de-

cline in the number of fish caught by Americans in the North Pacific Ocean? Just this: private shipbuilding and repair does a lot of work for the big fishing industry. And right now it's not all peaches and cream.

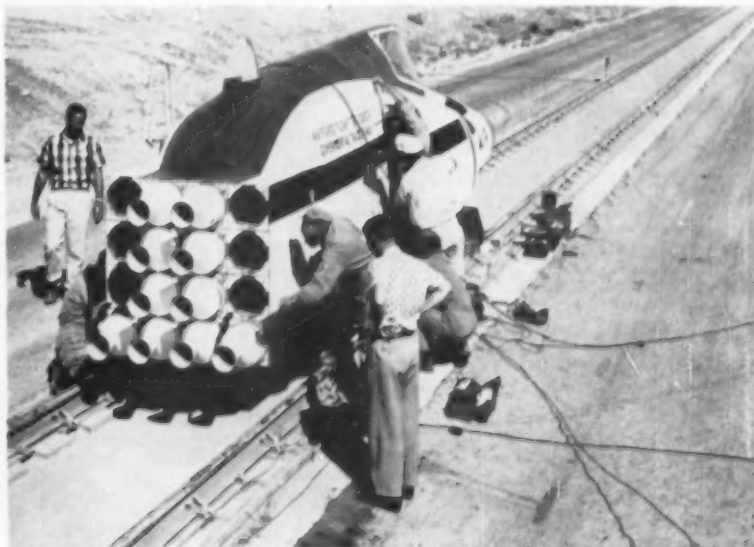
A Senate committee is studying the situation. Sen. Warren G. Magnuson (D, Wash.), chairman of the Senate Interstate and Foreign Commerce Committee, has begun a special hearing in Tacoma, Wash.

Says the senator: "Tuna imports have glutted West Coast markets, pushing our domestic tuna industry against the wall. And the decline of our coastal salmon fisheries has stifled our com-

mercial fishing industry to a point of approaching near bankruptcy.

"This situation has had a serious secondary effect upon the boatbuilding and allied industries of the Northwest, because the great preponderance of fishing vessels are constructed in Puget Sound ports."

And, of course, metalworking has a direct interest in shipbuilding. Coastal metalworking companies expand as ship construction booms. They have to turn to other fields when it contracts. Problems of tuna imports and salmon-run declines are many and complex. They're watched almost as closely by the area's metalworking firms as by the fishermen.



AIR FORCE and Convair technicians ready a Convair rocket sled for a high speed test of pilot escape system in the F-102A interceptor. The track is 10,000 ft in length. Sled is powered by 16 rocket motors.

Worth Looking At!

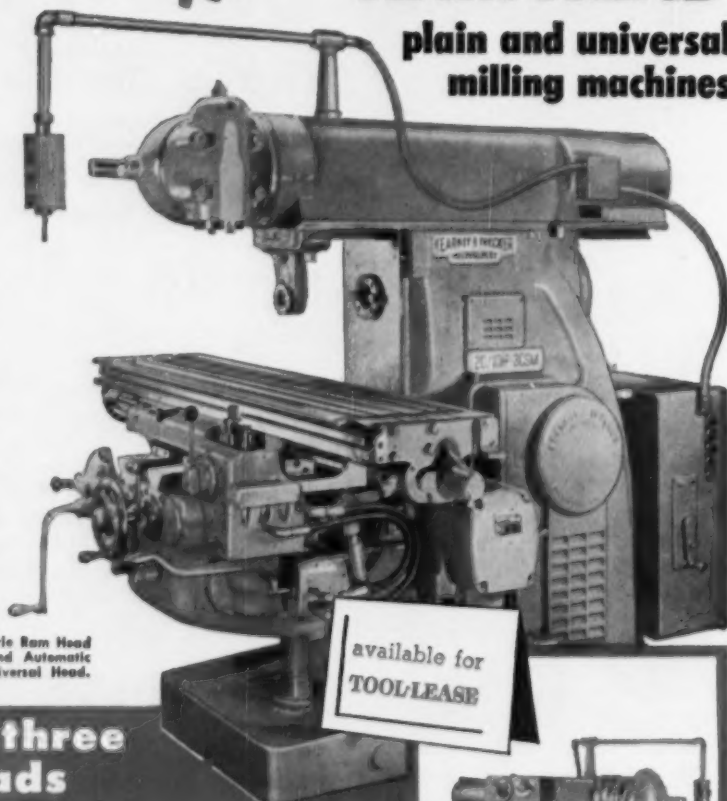
Kearney & Trecker's *NEW* RAM HEAD

plain and universal
milling machines

KEARNEY & TRECKER'S new line of Ram Head milling machines combines a conventional horizontal spindle and a self-contained motorized sliding ram. As a result, horizontal and vertical spindles can be run separately and simultaneously.

The Ram Head machines are available with a choice of three heads — Universal, Vertical and Quill types which can be rotated through 360°. You can perform vertical, horizontal and angular milling on one machine in a single setup. They are built in Model CH, CK and CSM designs with 69 different machines in sizes from No. 2 to No. 4 in both plain and universal styles. Machines may be equipped with either Standard Directional Table Control, or Mono-Lever and Automatic Cycle Table Control.

For the full story, contact your nearest Kearney & Trecker representative, or write Kearney & Trecker Corp., 6784 W. National Ave., Milwaukee 14, Wis.

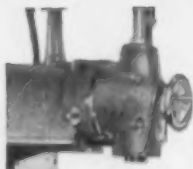


20/10hp No. 3 Model CSM, Plain style Ram Head milling machine with Mono-Lever and Automatic Cycle Table Control and Type U Universal Head.

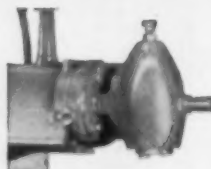
**with choice of three
types of heads**



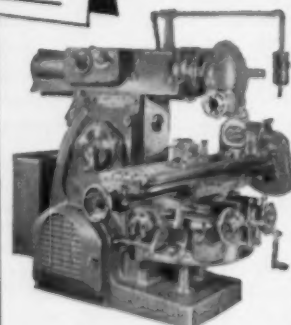
Type U Universal Swivel Head
Capable of numerous milling combinations, this Ram Head has two graduated bases at right angles to each other, both of which can be swiveled thru 360°.



Type Q Adjustable Quill Swivel Head
Spindle can be set at any angle through 360°. Ram Head has 3 1/2" hand-feed quill movement . . . micrometer stop and dial indicator for angular milling or boring of more than one height.



Type V Vertical Swivel Head
Especially adapted for vertical and angular milling. Spindle housing base is graduated and spindle can be set at any angle thru 360°.



7 1/2 hp No. 3 Model CH, Universal style Ram Head milling machine with Standard Directional Table Control and Type U Universal Head.



FREE CATALOGS!

Ask for catalog No. RH-10A for complete data on Ram Head Plain and Universal milling machines, and Tool-Lease bulletin, TL-10A. Also see our catalog in SWEET'S.



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Kearney & Trecker Corporation

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Do Job Shops Need New Financing?

Machine shops find business volume up . . . But stiff competition cuts profits . . . Bill collection lag adds to problem of keeping up tools and inventory . . . Financing plan offered—By E. J. Egan, Jr.

♦ AN EXPERIMENTAL package-financing plan has been used successfully by 12 metalworking firms during the past two years to modernize their plants and equipment, cut costs, and increase their profit margins.

The plan, as developed by Commercial Discount Corp., Chicago, will now be offered to other metalworking companies.

The package deal provides ready cash to (1) buy new equipment and pay for it on a deferred basis out of earnings, (2) finance larger inventories required by increased business volume, (3) help out where slow collections on accounts receivable might hold up important company operations.

Survey Starts It . . . The three-part plan evolved out of a survey that Commercial Discount made in the Chicago, Detroit, and New York-northeast New Jersey metalworking areas. The 73 firms studied were typical job shops specializing in machining, welding, stamping, casting, forging or otherwise fabricating components for large end-product manufacturers.

There has been an unprecedented amount of work offered to such specialty shops in the past few years. But with so many firms bidding for the available work, the bargaining advantage has remained consistently with the customer.

In many cases where large companies haven't been satisfied with the cost, quality or delivery service on these "farmed-out" jobs, they've set up to take the work back into their own plants.

Profits Shrink . . . Net effect of this competitive scramble has been shrinking profits for many job shops. For example, average net profit on sales for stamping plants included in the survey shows a drop from 6.5 pct in 1950 to 3.0 pct in 1955.

According to the finance firm, there are three major elements contributing to this picture of dwindling net profits: (1) the old metalworking equipment used by many job shops, (2) the financial burden of carrying larger inventories, (3) slower collections from customers.

In the equipment category, the study showed that about 55 pct of the metal cutting machines and about 58 pct of the metal forming units in these shops were between 10 and 20 years old. About 19 pct

of the cutting tools and 25 pct of the forming machines were more than 20 years old.

Tool Age Hurts . . . The finance company officials viewed this as a severe handicap to many of these firms, since post-World War II machine tools are generally considered to be about a third more productive than pre-war models.

The survey trend toward larger inventories apparently stems from larger business volume in general during the past five years. An added factor has been the natural desire to stockpile materials in view of continuous price increases and occasional shortages.

Assessed as typical was the report from one plant surveyed. It showed that inventory was about 65 pct of working capital in 1950, but had climbed steadily to hit an 80 pct mark this year.

Delay Payment . . . Over this same five-year period, the average time that customers take to pay their bills had also lengthened. For metal stamping plants covered in the survey, this waiting time has risen from an average of 31 days in 1950 to 39 days at present.

According to Commercial Discount Corp., the survey facts on equipment, inventories and collection delays pointed toward a fairly widespread need for more working capital.

A basic plan was tailored to match this need and 12 firms in the original survey areas agreed to try it experimentally. Report is that all were soon successful in meeting all competition



"IF YOU'RE going to get a guaranteed annual wage, how about me getting a guaranteed annual allowance?"

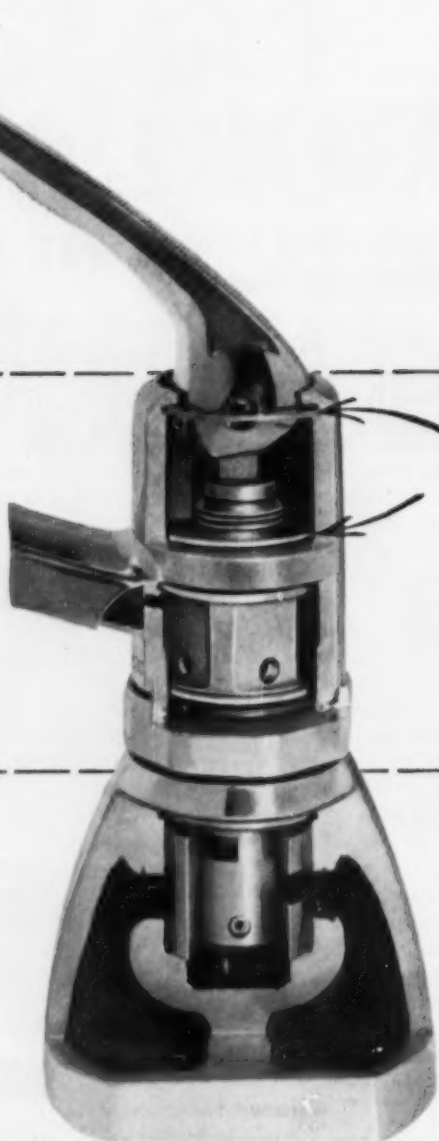
Look into **REVERE** Phosphor Bronze — it pays **RAVENNA** to use it!

This Moen Single Handle Mixing Faucet contains an anchor disc and an anchor washer, both stamped out of Revere Phosphor Bronze Strip. These are small parts, but in a fine product such as this faucet, high quality metals must be used throughout. Here is a condensation of the manufacturer's experience with the phosphor bronze:

Anchor Disc: • Standard punching speed maintained. • No pre-straightening off the arbor for the automatic punching process. • No excessive die wear. • Corners are sharp and clean; no de-burring needed. • Natural mill finish is better than they could achieve by tumbling or burnishing. • High tin content means no lubrication is required; they call it "silent brass."

Anchor Washer: • Have not had a single surface failure. • Dry tumble to de-burr. • Good fatigue characteristics and no obvious signs of corrosion.

Revere offers several types of phosphor bronze, each with slightly different characteristics. In addition to this alloy, Revere also supplies Ravenna with round and octagonal leaded brass tube and free-cutting brass rod, for use in various parts of the valve. We will be glad to collaborate with you on selection of just the right forms of the correct alloys for your products, present or projected. See the nearest Revere Sales Office.



Moen Single Handle Mixing Faucet, made by Moen Valve Co., Division of Ravenna Metal Products Corp., 6518 Ravenna Ave., Seattle 15, Wash.

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"The Revere Four-Way Service" is a 16 mm. sound motion picture in color, educational and informative. If you haven't seen it, write nearest Revere Office.



The Iron Age

SALUTES

Cloud Wampler

A successful investment banker, he was called on to head a large industrial concern. He brought to the job an immense capacity for work and some novel ideas on handling men.

When Cloud Wampler came to Carrier Corp. in 1941, he found labor and management at each other's throats over a cost-of-living increase. Mr. Wampler's background was mainly financial and he listened silently to arguments over how much living costs were up.

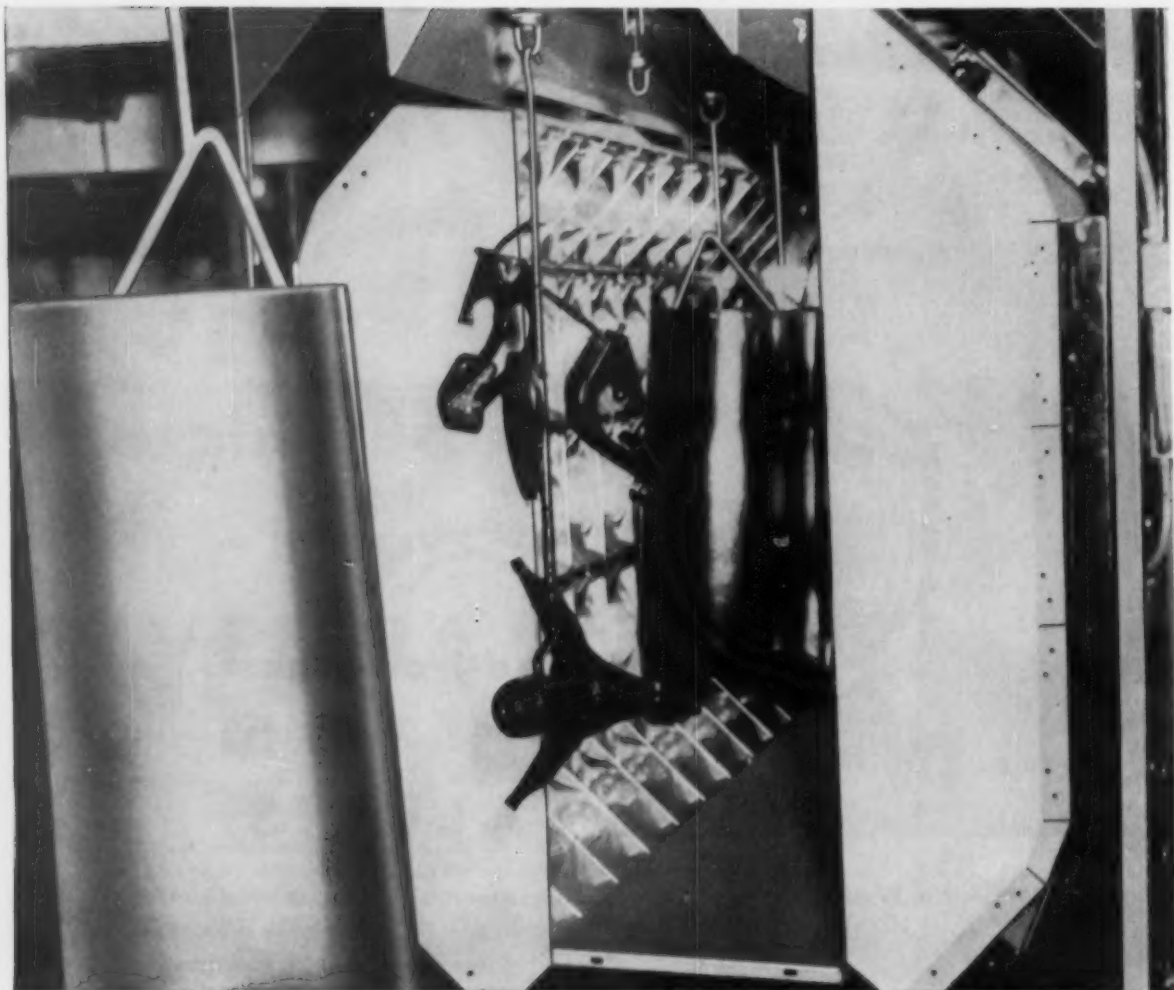
Finally, with a strike imminent, he stood up and proposed the forming of a labor-management group to study the matter. The group was formed. It came up with an index that was acceptable to both sides and the strike was averted. Soon after, Mr. Wampler took over as head of Carrier. He extended the policy of getting facts to and from all levels, setting up 163-man and 1000-man "cabinets" to voice employee thoughts, sponsoring the Carrier Institute of Business to educate employees in company operations.

Amiable labor relations are one result of Carrier's interest in two-way communications. The company has gone over six years without one written grievance from the union. Recently, Mr. Wampler received the sixth annual Industrial Relations Achievement Award of the National

Metal Trades Assn. for his work in promoting closer employer-employee ties, developing leaders and fostering civic interest.

At the same time, Cloud Wampler is a hard-driving, night-working boss who gets results. During his time with Carrier, volume has risen over \$146 million; net earnings over \$4.9 million. Tight budget controls, balanced organization, and modernized facilities have been a part of his program for company progress. He has preached a message of greater work efficiency through air conditioning, recently announced an expansion into all-weather conditioning. He is a great detail man, insists that letters be answered immediately, has a remarkable memory for names. He wants perfection but recognizes the need for tolerance.

Mr. Wampler was born in rural Illinois. He worked throughout his school and college days, went from Knox College to a \$10 bank job, was the Army's youngest General Staff Officer in World War I, became a successful investment banker in Chicago and joined Carrier in 1941.



Eleven minutes is just long enough to save some money

International Harvester *knew* that radiant heat was fast, but they still got a happy surprise when they installed a Fostoria Oven: Before, they had dried cream separators in a convection oven. The thing took up *480 square feet* of floor space and needed a baking cycle of *one hour*. (We won't even mention the long warm-up time.)

That's when Fostoria came in with a specially designed radiant oven that cost less to buy, less to operate. It fits handsomely in IH's production line. It's only *eleven feet* long, and bakes a neat finish coat of enamel on the separators in just *eleven minutes*. You can just bet your old convection oven they're happy with it.

Your plant? The same thing would happen. Let us show you how.



Write for FREE booklet
"APPLICATIONS UNLIMITED."



THE FOSTORIA PRESSED STEEL CORPORATION, Dept. 1224, Fostoria, Ohio

The Iron Age INTRODUCES

Garrett A. Connors, retired as vice president, industrial relations, **Pittsburgh Steel Co.**, Pittsburgh. He will continue as industrial relations consultant to the company. Mr. Connors spent 52 years in the steel industry.

John C. Lintern, elected president and director, sales, **The Lintern Corp.**, East Painsville, O.; **W. A. Lintern**, appointed secretary and treasurer, **Paul Arn**, named secretary.

Hans Wyman, elected president, **The Eleonora Chemical Corp.**, New York.

F. M. Adams, appointed executive assistant, **Axelson Manufacturing Co.**, Los Angeles.

Eduard Baruch, elected executive vice president, **Heli-Coil Corp.**, Danbury, Conn.

Joseph Solari, elected executive vice president, **Great Lakes Carbon Corp.**, New York.

J. Joseph Kelly, elected vice president, sales, **Reed-Prentice Corp.**, Worcester, Mass.; **Fredrick W. McIntyre, Jr.**, appointed vice president and works manager.

C. J. Beasley, appointed vice president, **Metal & Thermit Corp.**, New York; **C. R. Hervey**, appointed controller; **Henry Bryk**, appointed superintendent, **Thermal Metal Dept.**, New Jersey.

George E. Kopetz, appointed vice president, production, **Blaw-Knox Co.**, Pittsburgh, Pa.

William F. Huber, elected vice president, **Southwestern Ohio Steel, Inc.**, Hamilton, O.; **James O. Barnthouse**, elected secretary-treasurer.

Harvey S. Vincent, appointed vice president, sales, **Tammen & Denison, Inc.**, Chicago.

George R. Galbraith, appointed assistant vice president, **Walworth Co.**, New York.

B. H. Sullivan, Jr., appointed assistant vice president, **Magnus Metal Corp.**, New York.

Richard G. Nolte, appointed vice president and assistant to president, **Duff-Norton Co.**, Pittsburgh.

Harold Nohe, elected treasurer, **Heli-Coil Corp.**, Danbury, Conn.

Howard A. Law, Jr., appointed assistant to treasurer, **Republic Steel Corp.**, Cleveland; **Jeff H. Howell**, appointed superintendent, hot strip finishing, **Warren, O.**; **A. F. Prust**, named assistant chief metallurgist, **Warren, Ohio.**

Alexander Glass, named superintendent, Maintenance Dept., **Beech Bottom Works, Wheeling Steel Corp.**; **William J. Scharffenberger**, appointed assistant to controller.

PERSONNEL



DONALD C. DUVALL, elected vice president, industrial relations, **Pittsburgh Steel Co.**, Pittsburgh.



DAVID R. ANDERSON, elected vice president and controller, **Pratt & Whitney Co., Inc.**, W. Hartford, Conn.



GEORGE F. McDONOUGH, elected vice president, industrial relations, **Pratt & Whitney Co., Inc.**, W. Hartford, Conn.



CHRIS J. WITTING, appointed vice president, **Westinghouse Electric Corp.**, Pittsburgh.

PERSONNEL

Oswald Tower, Jr., named plant superintendent, **Michigan Seamless Tube Co.**, South Lyon, Mich.

Jesse F. Core, appointed general superintendent, Frick District mines, Coal Div., **U. S. Steel Corp.**, Uniontown, Pa.

C. J. Holden, named sales manager, Passenger Car Wheel Div., **Motor Wheel Corp.**, Lansing, Mich.; **R. J. Kinney**, named sales manager, Truck Wheel Div.

Oliver E. Beutel, named manager, distribution and traffic, Texas Div., **The Dow Chemical Co.**, Midland, Mich.

Paul N. Strobell, named marketing manager, atomic energy products, **Alco Products, Inc.**, Schenectady; **Herbert M. Short**, appointed product manager, renewal parts; **Frederick Townsend**, appointed locomotive product manager.

Duane F. Kuntz, appointed assistant manager, motor truck sales, **International Harvester Co.**, Chicago.

Robert L. Bluhm, named district sales manager, **Iron Fireman Manufacturing Co.**, Cleveland.

Theodore A. Rapp named industrial sales manager. **R. Hoe & Co., Inc.**, New York.

Robert H. King, named assistant plant manager, **Rheem Manufacturing Co.**, Downey, Calif.

William M. Briner, named production control manager, Fastener Div., **Standard Pressed Steel Co.**, Jenkintown, Pa.

Robert J. Moore, appointed sales manager, packaged products, Air Conditioning Div., **Westinghouse Electric Corp.**, Staunton, Va.



JOHN C. FERGUSON, elected secretary, **Superior Steel Corp.**, Carnegie, Pa.



CARL A. BREUER, appointed general manager, operations, **Pittsburgh Steel Co.**, Pittsburgh.

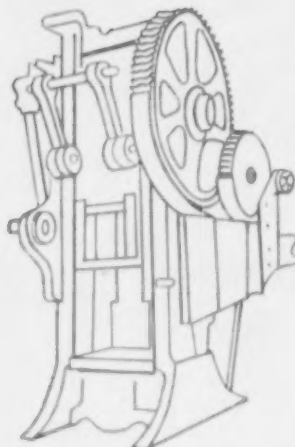


MERRILL A. HAYDEN, appointed general manager, **Waterbury Tool Div.**, **Vickers Inc.**, Waterbury, Conn.



THOMAS G. BISHOP, appointed sales manager, Plastic Machinery Div., **The Hydraulic Press Mfg. Co.**, Mount Gilead, Ohio.

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Investigate the important production, maintenance and tax savings of **SIMMONS ENGINEERED REBUILDING** for your: Lathes, Planers, Surface Grinders, Cylindrical Grinders, Vertical Millers, Openside Planers, Automatics, Vertical Boring Mills, Turret Lathes and Radial Drills.

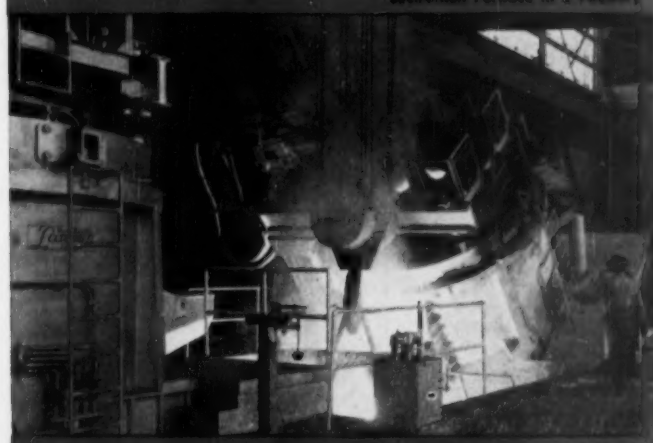
A qualified Simmons rebuilding engineer will discuss it with you. Write, wire or phone today. **Simmons Machine Tool Corporation**, 1721 North Broadway, Albany 1, N. Y.

SIMMONS GIVES MACHINE TOOLS A NEW LEASE ON LIFE

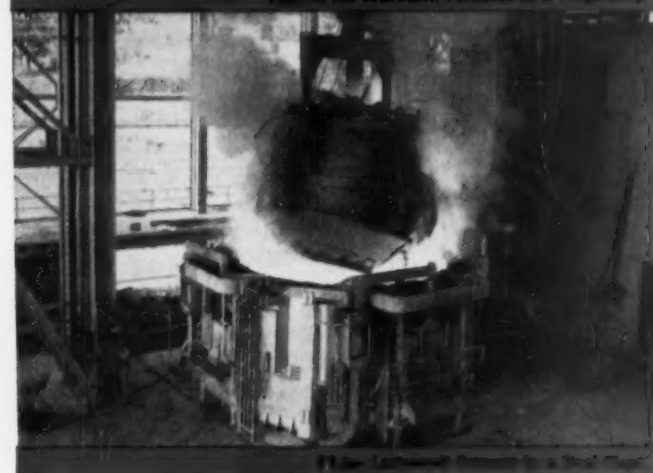
Unconditional guarantee...our standard since 1910



Lectromelt Furnace in a Foundry



Two 75-Hp Lectromelt Furnaces in a Forge Shop



Manufactured in... GERMANY: Friedrich Kocks GMBH, Dusseldorf... ENGLAND: Birlec, Ltd., Birmingham
... FRANCE: Stein et Roubaix, Paris... BELGIUM: S. A. Beige Stein et Roubaix, Bressoux-Liege... SPAIN:
General Electrica Espanola, Bilbao... ITALY: Forni Stein, Genoa... JAPAN: Daido Steel Co., Ltd., Nagoya

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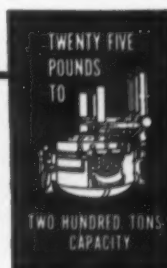
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Paul R. Munich, Jr., named general sales manager, Materials Handling Div., **The Yale & Towne Manufacturing Co.**, Philadelphia.

C. G. Crawford, named sales manager, **Baldwin-Lima-Hamilton Corp.**, Philadelphia.

Don Herendeen, named representative, sales and services, **C & D Batteries**, Baltimore.

John W. See, appointed application engineer, hydraulics devices, **Greer Hydraulics, Inc.**, Jamaica New York.

William M. Scanlon, named Detroit sales representative, **Republic Steel Kitchens**.

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J. D. Simmons, appointed sales representative, Central Michigan and Northern Ohio, **Betmur Steel Corp.**, Detroit.

John J. Crushank and Frank H. Norwich, appointed sales engineers, **Whitehead Metal Products Co., Inc.**, Buffalo.

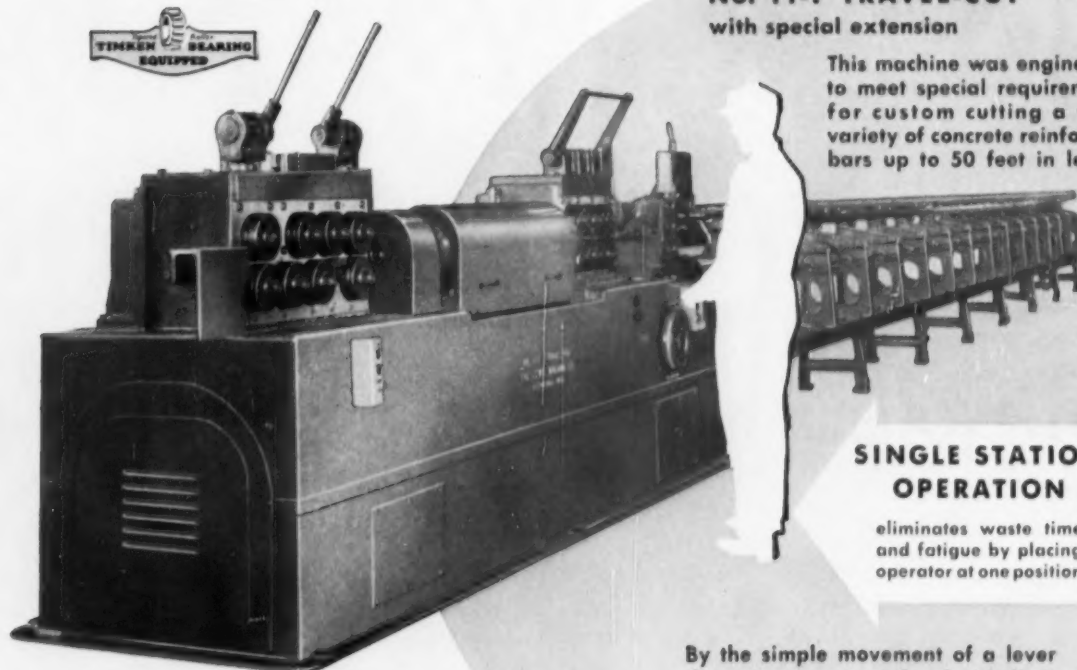
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December 22, 1955



Inland's production balance, ever-sensitive to the varying requirements of midwestern industry for a wide range of carbon steel products, is a real advantage to steel users.

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Offers unique properties—

Alloy Plating Can Give Your Products New Appeal

- ◆ Co-deposition of metals has intrigued platers for a long time but it's been only recently that major roadblocks to commercial application were removed . . . Now, several alloys can be deposited, giving unique properties not obtainable by plating with single metals.
- ◆ New alloys, solutions and anode systems, plus improved control, make it possible to upgrade sales appeal and quality of products . . . Lead-tin, speculum, tin-nickel, tin-zinc and white brass are among the more recent additions to this rapidly expanding field.

By F. A. LOWENHEIM, Supervisor Electrochemical Research,
and R. T. GORE, Technical Service Engineer,
Metal & Thermit Corp., New York

◆ PLATING of alloys—rather than single metals—is rapidly growing into a field of its own. Among metal finishers, it is gaining in importance because it offers unique combinations of properties and improved sales appeal of products with attractive new coatings.

Until recently, rapid and widespread adoption of alloy plating had been deterred by problems encountered in controlling the composition of deposits from some of the earlier plating baths. In recent years, not only have new alloys been introduced, but new solution formulas, new anode systems and improved control techniques have, for the most part, overcome these previous difficulties.

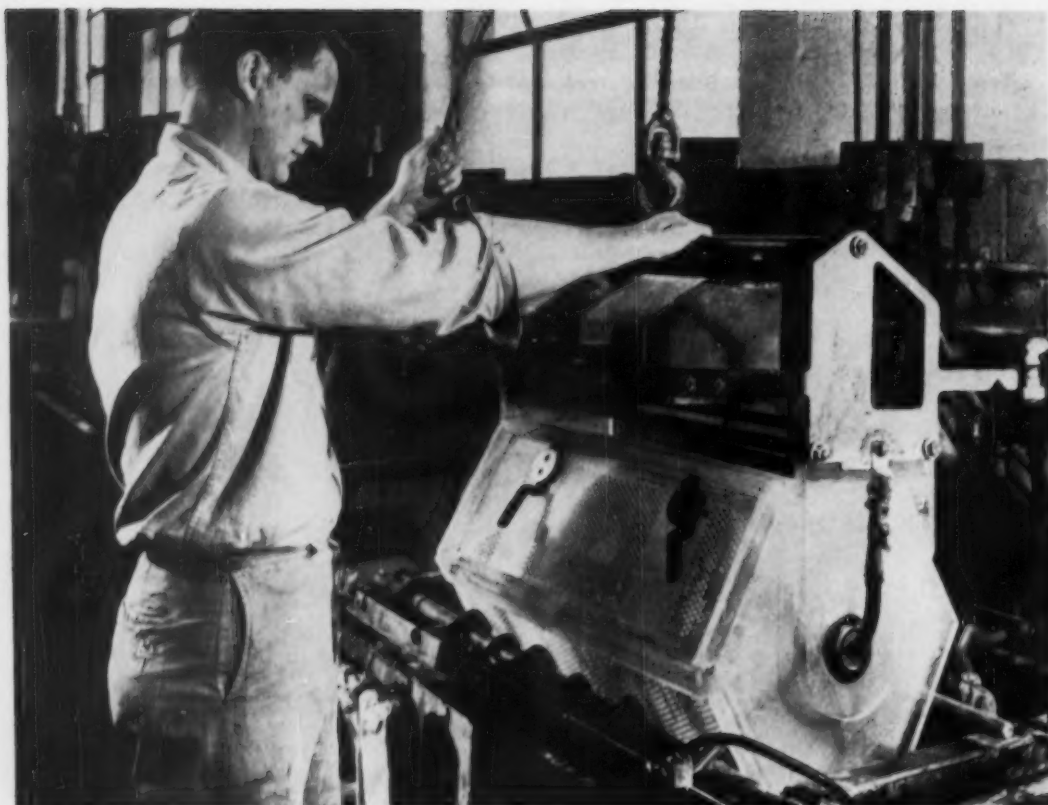
In addition, another important factor in the metal finishing industry is working favorably for wider adoption of alloy plating. It is the recognition of the importance of analytical con-

trol of all plating solutions and the willingness of platers to undertake use of those processes which require such control. Demands for higher quality and more exacting specifications have brought about the necessity of analyzing solutions as conventional practice.

Few, if any, alloy plating processes can be operated successfully without this analytical control. Now that it is standard procedure in all progressive plating shops, the main deterrent to alloy plating has been removed. With such control, platers find that many alloy baths are no more difficult to operate than single-metal baths.

In light of these developments, a particular combination of properties may be acquired for a specific application from plating baths which are both simple to operate and easy to control.

Development of alloy plating has been slow.



NEW TECHNIQUES and alloys, and better methods of control, permit co-deposition of metals with

same ease as single metals. Here, operator barrel plates alloy on small parts.

Only two alloys were in common use 50 years ago—brass and the various carat golds. As late as 1941, a nickel-cobalt was added to the list, although bronze was plated on a limited scale for special purposes. Reasons for slow development were that major effort was directed toward bright plating to eliminate buffing, and improvement of existing commercial processes.

Work on alloy plating, until recently, rarely reached beyond the beaker stage. Not much had been done to control plate composition. The influence of such factors as temperature, pH, and accidental impurities in solutions had not been investigated. Analytical procedures were known, but these were more suited to research than day-to-day control.

Several conditions had to be met before alloy plating could become commercially acceptable: (1) Need for the coatings which came from demands by industry and the armed services to meet special requirements, and to replace with suitable combinations other metals in short supply; (2) Establishment of procedures which could be carried out by technicians rather than research chemists; (3) Processes had to be simplified and the influence of variables studied.

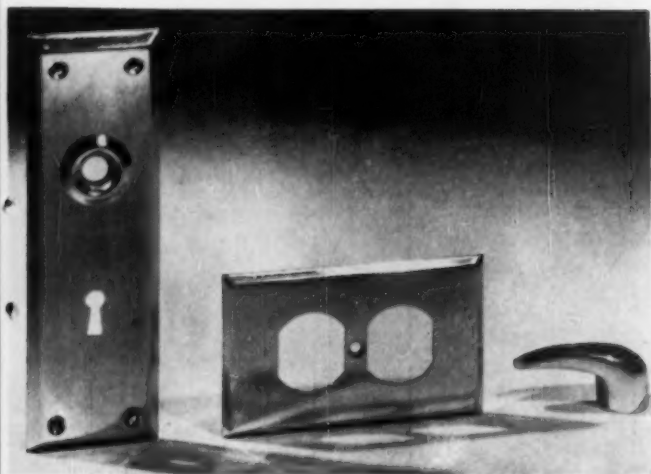
These conditions have been met for several alloys. Moreover, the combinations of metals which can be co-deposited often have properties which are not merely averages of the alloying constituents, but are entirely new and unexpected.

Not always easy to adapt

The job of adapting a process for plating the desired alloys in plant production is sometimes more difficult than that of developing the process. In bronze (copper-tin) plating, for example, early baths utilized separate tin and copper anodes, with individual current control for each anode bus. Proper balancing of anode dissolution rates was difficult. Another method used bronze alloy anodes, but these were difficult to dissolve.

A process in use today overcomes the principal problems formerly encountered with copper-tin plating. It uses copper anodes in a cyanide solution and supplies the tin to the bath by scheduled additions of potassium stannate.

Results of development work are frequently unexpected. Alloys sometimes exhibit properties unlike those of either constituent metal. For ex-



BRONZE alloy resembles 24-carat gold finish but also serves well as protective undercoating. It can be plated fully bright.

ample, both tin and nickel, when plated alone, soon tarnish in the air. On the other hand, the tin-nickel alloy has excellent resistance to tarnishing. Thus, each alloy plating problem can be solved only by experimentation. Optimum bath composition and combination of variables must be developed empirically.

Once the proper bath for a given alloy is found, control is not much different from that

for single-metal deposition. The same principles apply, but the variables must be combined to cause the metals to co-deposit at the same potential.

For a number of important alloys, the baths have been stabilized and are easily handled and accurately controlled. Composition and thickness of deposits can be held within close limits. Deposition rates have been accelerated.

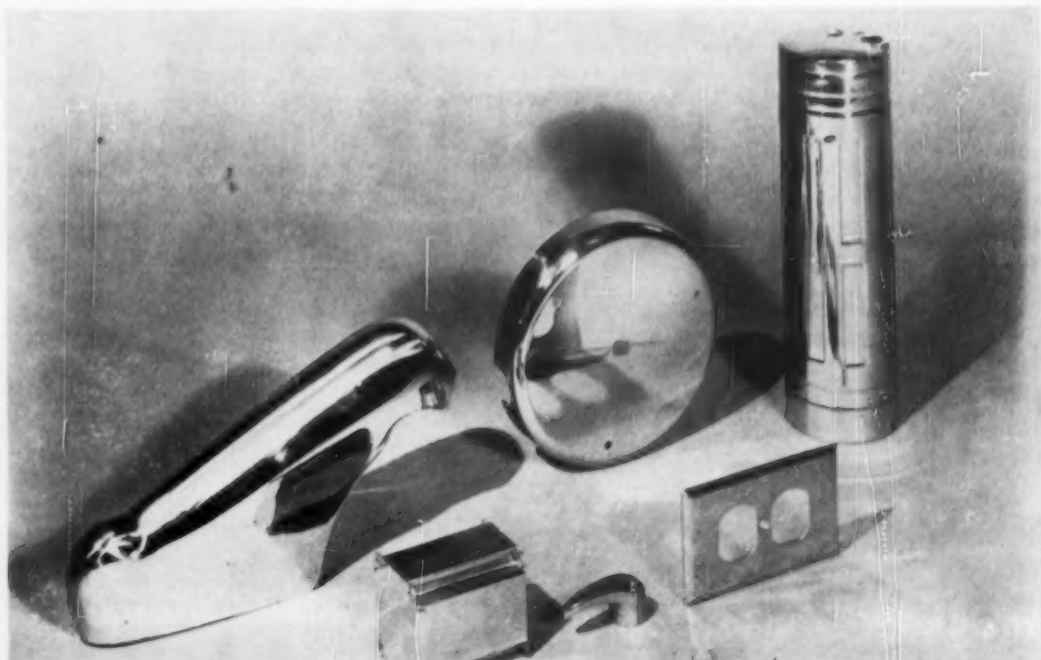
These developments have helped alloy plating to grow at a more rapid rate. Present and potential uses are numerous for decorative finishes, protective coatings and engineering applications.

Alloy platings generally tend to be denser, harder and of finer grain size than deposits of their constituent metals. They may also be more corrosion-resistant and brighter than either single metal and more readily buffed. Several offer high resistance to corrosion, either as a final finish or a protective undercoat.

Bright deposits may be obtained, with and without the use of addition agents, depending on the alloy. A great variety of color effects may be produced with brass, gold and bronze alloys. In some cases, substitution of an alloy composition, such as copper-tin for nickel, actually reduces metal costs.

Other special qualities obtainable through alloy plating are good solderability (tin-zinc) and rubber adhesion (brass). Superior throwing power, essential in plating intricate shapes, is a characteristic of the tin alloys.

TIN-NICKEL alloy gives these parts greater tarnish and corrosion resistance than when plated with either metal alone.



TIN-ZINC alloy imparts excellent solderability to parts like this electronic equipment. Moreover, it retains this property in storage.



Among the alloys which have attained commercial status, brass was one of the first. It duplicates the appearance of solid brass in a protective finish for iron and steel, and promotes the adhesion of rubber compositions to steel and other metals. The influence of bath constituents on plating procedure has been determined, and control of the process has been improved.

Cyanide solutions are currently employed. The bath contains copper cyanide, sodium-cyanide and usually sodium carbonate. Amounts of the constituents can be varied to alter the copper zinc ratio. To maintain cathode efficiency, low current densities are used.

Brass solutions are maintained at room temperature or higher. Addition of ammonia, arsenic or proprietary agents regulate the color of the deposit. When bath temperature and composition are properly controlled, the solution produces uniform color and has good throwing power.

Bronze alloy is the most promising protective undercoating for nickel-chromium plating. It may also be used as a decorative finish to closely resemble 24-carat gold. As an undercoating for chromium, bronze is more corrosion-resistant than copper, provides better coverage in recessed areas, and deposits rapidly. Throwing power is superior to that of copper. Addition of a brightening agent permits plating fully bright with but little loss of ductility.

Alloy variation changes color

The usual bronze composition is 88 pct copper and 12 pct tin. Varying the proportions changes only the color. The bath contains potassium cyanide, copper cyanide, potassium hydroxide, potassium stannate and Rochelle salt. Copper anodes are used; the tin being supplied by the potassium stannate.

Solution temperature should be maintained between 145° and 160°F. Current densities up to 100 amp per sq ft are used.

Lead-tin alloys containing 93 pct lead and seven pct tin, are being electrodeposited as bearing metal. A 40-pct lead, 60-pct tin alloy has been used as a solderable coating in the electronics field.

Solutions containing the fluoborates of the constituent metals are being successfully operated. A typical bath for plating lead-tin alloys contains boric acid, fluoboric acid, fluoborates of lead and tin and a small quantity of glue or other addition agent. The bath operates at room tem-

perature or above. Current densities may range from 20 to 50 amp per sq ft.

Nickel-cobalt alloys containing from one to 20 pct cobalt to nickel produce bright decorative finishes. Advantages are also claimed for nickel-cobalt in finishing magnesium alloys.

Speculum is a copper-tin alloy offering hardness and resistance to tarnish and corrosion. Its color is silvery-white, closely approaching that of silver. A common use of speculum plate is for polished reflectors.

An older speculum plating solution contains tin, copper, free sodium cyanide and caustic soda and uses separate copper and tin anodes. More recently, a proprietary solution has been introduced which employs alloy anodes and deposits the coating in a bright condition.

Tin-nickel gives good protection

Tin-nickel alloy is deposited as an intermetallic compound in the proportion of approximately 65 pct tin and 35 pct nickel. The alloy offers excellent resistance to corrosion and tarnish. The plate also has good frictional qualities and is readily solderable. Throwing power of the solution is exceptionally good.

The tin-nickel solution is made up of nickel chloride, stannous chloride and ammonium bifluoride. It operates at 150° to 160°F and a current density of 25 amp per sq ft. Separate tin and nickel anodes are used on a common circuit.

Tin-zinc alloy has excellent solderability, either when freshly plated or after prolonged storage. It retains this property after aging, to a remarkable degree. The plate also offers good corrosion resistance. This combination of properties has led to its use in the electronics industry.

The usual composition is 78 pct tin and 22 pct zinc. The solution contains potassium stannate, zinc cyanide, potassium cyanide and free potassium hydroxide. The bath operates at 145° to 155°F with a current density range of 15 to 50 amp per sq ft. Alloy anodes are used.

White brass is an alloy with high zinc content and approximately 20 pct copper. Since the alloy deposits bright and offers good corrosion resistance, it has been used as a substitute for nickel. A disadvantage is its tendency to form the white corrosion products characteristic of zinc. White brass is plated from a solution containing zinc cyanide, copper cyanide, sodium cyanide and sodium hydroxide.



A builder asks—

So You're Going to Buy a Press?

- ◆ Planning to get a new press? . . . Then you'll most likely set up to depreciate it over the next 10 or 15 years . . . And since you'll be probably be running many jobs on it during that time, you'll need plenty of built-in versatility.
- ◆ Here's basic information to guide you in making wise buying decisions . . . There are tips on hydraulic and mechanical presses, rated capacities, speeds, adjustment and safety features, and lubrication systems.

By M. D. VERNON, Executive Assistant, Verson Allsteel Press Co., Chicago

◆ **HOW ARE YOU** at predicting the type of work a press will be doing in your plant 10 or 15 years from now? That's a difficult question to answer. But it's something you must try to do when you're selecting a press today, because it is going to be depreciated over a 10- or 15-year period. Moreover, it must be able to handle a wide range of jobs in that time.

Your only solution is to buy a press for today's job—but to get one with enough built-in versatility so that it can be adapted quickly and easily to future types of work.

Before you go shopping for a press you usually determine the length of stroke, bed area, shut height, speed and capacity that you feel will be necessary. In many cases, once these specifications are set down, bids are called for and the low dollar bid gets the job. This method will get you a press to meet your basic mechanical requirements, but will it really get you your money's worth?

A reliable press builder can give you your money's worth—if he knows your complete problem. And this calls for more than a basic list

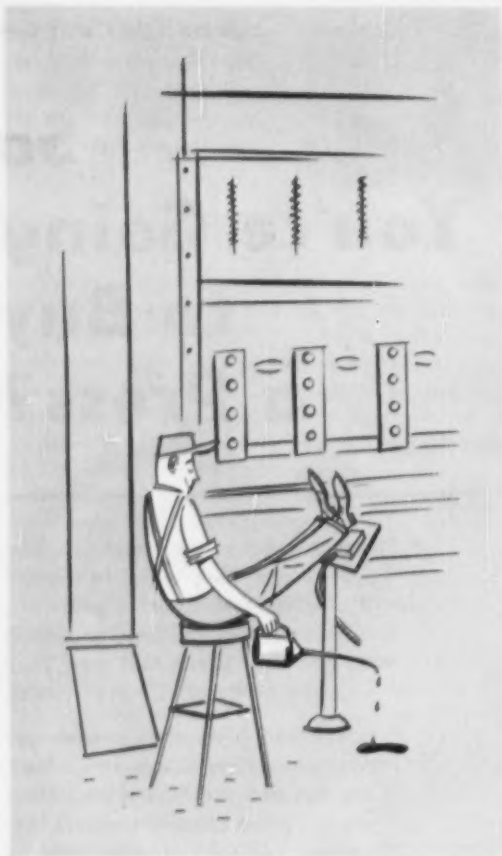
of dimensional and mechanical specifications. The builder must know what you want the press for, what flexibility may be necessary in the future, and how much money you believe you can spend.

After all, the builder knows better than anyone else what his equipment can do. He's developed and improved his models over the years to give you longer tool life and less maintenance, greater flexibility and less downtime. If he knows your complete problem he can give you the best press for your money. It won't always be the low bid—but it will be the most press.

Mechanical v. hydraulic

Part of the "complete problem" often involves the question of buying a mechanical or a hydraulic press. Hydraulic units have one chief advantage when it comes to press capacity; the maximum amount is available at any point of the stroke length. This may permit the use of a smaller machine—a 100-ton hydraulic press, for example, where a 200-ton mechanical unit is indicated.

On the other hand, hydraulic presses are gen-



"... lack of proper lubrication is one of the prime causes of press downtime."

erally slower than mechanical types. A 100-ton hydraulic machine with a standard 16- to 18-in. stroke would deliver possibly eight strokes per minute on a non-working basis. A mechanical unit of the same capacity, and even the same stroke length, would work considerably faster.

One answer, if possible, is to combine some of the best features of mechanical and hydraulic presses. One solution is to add horsepower and pumps to the hydraulic type. It is expensive but is often done for deep-draw work. Another alternative is to buy a modified standard mechanical press.

Rated capacity of mechanical presses diminishes as the distance from the bottom of the stroke increases. Standard practice among builders is to develop rated capacity $\frac{1}{2}$ in. off the bottom of the stroke. It is almost universal that at a point one inch up the stroke, capacity is only 72 pct of the full rating, regardless of stroke length. And at $1\frac{1}{2}$ in. "off the bottom," this drops to approximately 62 pct.

This up-the-stroke loss of tonnage capacity is a fact that many press buyers lose sight of. They estimate their dies at 100 tons and then buy a 100-ton press. But they fail to consider

that the work starts one or two inches up, and that is where the full capacity is needed.

If tooling shows a need for a press with 100 tons of capacity two inches up on a standard 10-in. stroke, a reference table will show that only 56 pct of rated tonnage is available at that point. Dividing 100 by 0.56 shows that a press with a rated capacity of 180 tons is needed.

In determining press speed, certain materials have limitations as to the speed at which they can be worked; setting the press to run faster will not produce more good parts per hour. Mid-stroke slide velocity limits for some materials are: Steel, 55-60 fpm; brass and copper, about 100 fpm; aluminum, about 140 fpm.

Get high mid-stroke velocity

There are cases where tricks in tooling allow faster speeds, but they are unusual. Because mid-stroke is the fastest point of the mechanical press stroke, and speed drops off beyond that point, it is best to choose a press whose mid-stroke slide velocity is a bit higher than that required.

However, if a press is too fast it is difficult to change slide velocity without affecting machine capacity adversely. For example, consider a 100-ton capacity press with a variable speed drive that allows 10 to 20 strokes per minute. As with all mechanical presses, it is built to deliver rated capacity at the mid-speed of 15 strokes per minute.

But press capacity varies as the square of the speed, so that at 10 strokes per minute, available capacity of the 100-ton press is only about 44.44 tons. Conversely, at 20 strokes per minute, the flywheel is going around fast enough to deliver almost 180 tons. Speeding up, as in the latter case, can be dangerous if the press frame is not strong enough. At least it demands caution in selecting dies for the press, and in setting them.

For certain punching, return flanging, blanking, drawing and shallow forming operations, the modern press brake can frequently be an effective and economical piece of equipment. It is common practice to take a standard press brake, put a wide bed and flanges on it and increase the stroke; possibly to 6 to 8 in. on small and medium units and about 10 in. on larger machines.

One press brake shipped recently had a 375-ton capacity, a 46 by 144-in. bed plate, a 19-in. shut height, an 8-in. stroke running at 25 strokes per minute, and 100 tons of cushion capacity. Its price was \$40,000—far less than it would have cost to buy a conventional press to do the intended work.

In buying a press with power adjustment, check for limit switches on the maximum panel "down" positions. Presses of this type are generally built to have one and one-half times the diameter of the adjusting screw remaining in the barrel when the adjustment is all the way



"... speeding up can be dangerous if the press frame is not strong enough."

out. With limit switches at the maximum "down" position, the screw cannot get out far enough to bend.

Another desirable adjustment feature is a key lock on the elevating (up and down) buttons. Once the adjustment is set it is locked to prevent anyone but the die setter from making changes in the setting.

Power to the press slide can be transmitted

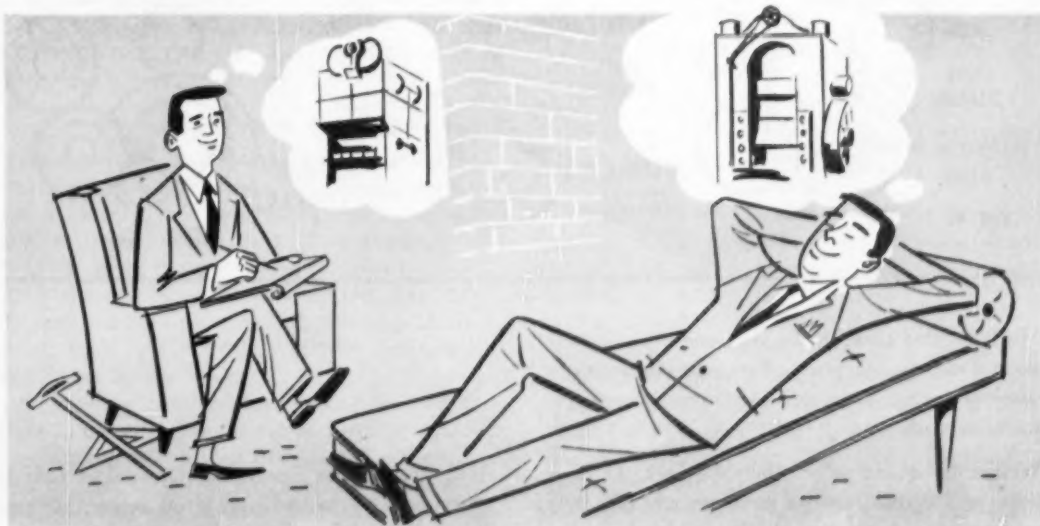
from one, two or four connections, or points of suspension. With one and two points of suspension, some care is required in balancing the load to prevent cocking the slide and possibly ruining the tools. But again, it is the builder who is best equipped to decide how many points of suspension are needed—if he knows the "complete problem."

An elementary precaution for press safety is a set of push buttons for each operator, wired in series so that both hands of each operator must be used to depress all the buttons before the press will trip. Moreover, adjustment of the cam that controls the limit switch will force the operators to keep their hands on the buttons until the dies are closed completely.

Since lack of proper lubrication is one of the prime causes of press downtime, the type of lubrication system is important in selecting a press. A good mechanically-driven, automatic lubrication system is a wise investment. Actually two systems will probably be required; one to lubricate certain points with oil, the other for points best lubricated with grease.

The deluxe type of lubrication system consists of a pump and motor assembly built into the press, also a built-in sump. Oil is pumped from the sump through a filter, and finally to the top of the press where it flows over the gears. It is then channeled to flow into the bearings, down the connections to the pitman, then further down the slide back into the sump.

In addition, another stream of oil is channeled to flow onto the gibways. There are two advantages to this system. One is that it is possible to lubricate the important flywheel bearings automatically. The other is that built-in pressure switches will shut the press off automatically anytime there is a blockage in any of the lubrication lines in the system.



"... a reliable builder can give you your money's worth if he knows your complete problem."

Faster production—

Screw Machine Attachment Rolls Accurate Threads

♦ A new type of thread rolling attachment on 6-station automatic bar machines aids rocker arm valve stud production at Pontiac Motor Div. . . . It assures accuracy of threads within 0.0005 in.

♦ Attachment does not interfere with other machining operations . . . Studs are not rechucked throughout the entire cycle . . . Method saves handling, and thread roll life is excellent.

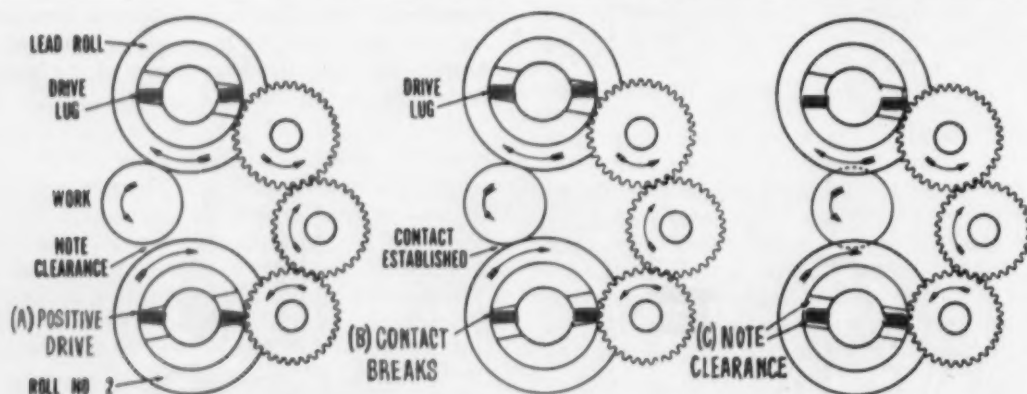
By W. G. PATTON, Engineering Editor

♦ TO PRODUCE 16 rocker arm valve studs for each of its new V-8 engines, Pontiac Motor Div. had to find a setup that would (1) assure the required production of 2500 per hr, (2) meet accuracy specifications, (3) deliver maximum output per sq ft of floor space, (4) hold production costs within competitive limits.

The method adopted involves the use of unusually compact tooling on 10 Acme-Gridley

six-station automatic screw machines. A maximum of three tools is used at a single station. Operations performed on each workpiece include turning, longitudinal step drilling, thread rolling, cross drilling and cut-off.

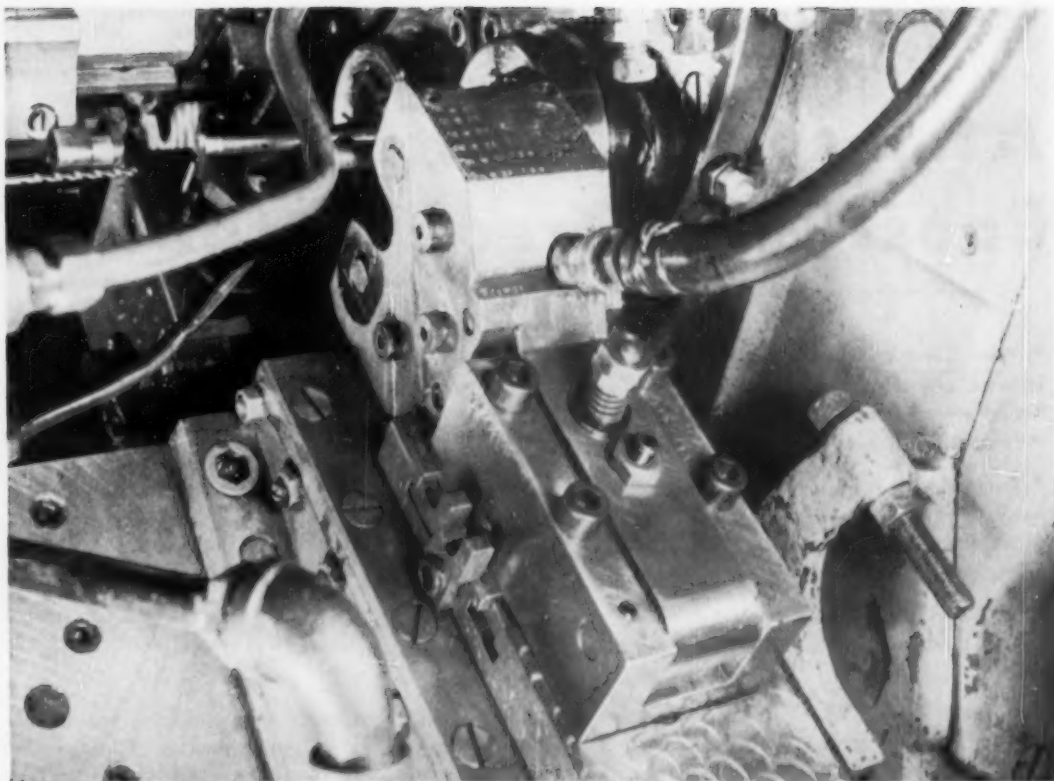
Perhaps the most interesting operation is the thread rolling done at the fourth tooling station. Specifications call for a thread that is concentric with the tapered surface within 0.004-in., total



LEAD roll first contacts the work and drives (A) the second roll through gears. Both rolls are positively synchronized up to the moment the second roll contacts the work.

WHEN the second roll contacts the work, the drive between the rolls releases automatically (B). Both rolls are then driven individually and freely by the workpiece.

THE "lost motion" provided (C) enables rolls to move right up to and past dead center. Without this motion rolls cannot function properly and gears would tend to bind or break.



COMPACT attachment on screw machine rolls threads quickly. Accuracy is within 0.0005 in.

indicator reading. Steel specified for the part is SAE 1118.

Tools used for most of the stud-making operations are standard for automatic screw machines. However, the thread rolling attachment is a new design recently introduced by Salvo Tool & Engineering Co., Detroit. It fits into the standard keyway on the cross slide of the machine, and is held in place by four 7/16-in. bolts.

Work drives both rolls

As shown in the accompanying diagram, the lead roll first contacts the work, driving the second roll through gears. At this point the two rolls are positively synchronized. This continues up to the moment the second roll contacts the work.

As the second roll makes contact, the drive between the rolls automatically releases. At this point, both rolls are being driven individually and freely by the work.

The Salvo tooling arrangement enables the tools to move up to and past dead center without any binding or breakage of rolls and gears. Tool life on the valve stud job has been excellent. Accuracy of the threads is consistently held within 0.0005-in.

This tooling arrangement has other advantages

in addition to high production, high accuracy and good tool life. They include: (1) ability to tap or drill and thread the part in the same position, (2) low cross slide pressure, (3) ability to roll within $\frac{1}{2}$ thread of a shoulder, (4) adequate rigidity, (5) production of straight threads without taper.

The fact that rechucking is avoided throughout the entire series of operations is another important advantage of this tooling setup.

Physical tests on rolled threads show that they have a high elastic limit as well as a high degree of resistance to wear or stripping.

Thread rolling attachments of this type can also be fitted to hand screw machines, turret lathes, and engine lathes, as well as to automatics.

The thread rollers at Pontiac are operated with a standard type cam having a special vise. The tool has rapid advance and return, and adequate clearance is provided under the attachment for cross slide tools. A positive return cam assures return of the slide and attachment to off-center position after threading.

After they are machined, the studs are centerless ground and surface hardened by carbonitriding.

Atmosphere Controls Boost Heat Treat Output

♦ When Tulsa Winch Div. modernized its heat treat department it installed new batch-type furnaces with automatic atmosphere and temperature controls . . . The move has more than paid off in fewer rejects, better control and doubled production.

♦ Production at the plant averages 60,000 lb per month on a job lot basis . . . Volume is made up of 125 different parts weighing from 2 oz to 40 lb . . . The carbon control instrument is particularly efficient for batch-type production.

By T. N. DUNCAN, General Supt., Tulsa Winch Div., Vickers Inc., Tulsa, Oklahoma

♦ FEWER REJECTS, double production, and more accurate control of batch-type heat treating operations have been achieved by Tulsa Winch Div., Vickers Inc., through the use of an accurate carbon control system.

Right now heat treat production at this plant averages 60,000 lb of steel per month. This volume is made up of 125 different parts. Part size varies considerably. The largest weighs close to 40 lb while the smallest checks in at a little less than two ounces.

Steels heat treated consist mainly of SAE grades 8620 and 1020 for carburizing and the medium-carbon grades 8640 and 1040 for straight hardening operations. In addition to carburizing and hardening, a limited amount of normalizing of forgings is handled as required.

Before the start of a modernization program, the heat treat area had been doing all of its carburizing in old fashioned pit-type, gas-fired furnaces. Raw natural gas was used as the carburizing medium. The combination of antiquated equipment and inadequate controls resulted in a high degree of inefficiency and an alarming rate of rejections.

When modernization was started, it was decided to install new batch-type furnaces together with accurate, automatic atmosphere and temperature controls. The batch-type promised to be most efficient largely because the shop handles most of its production on a job lot basis.

For all atmosphere control and carburizing, the "Carbotronik" automatic carbon potential control system is now being used. Designed and developed by Ipsen Industries Inc., Rockford,

Ill., this equipment was intended specifically for use on batch-type furnaces. The furnace, also made by Ipsen, is the straight-through type that provides the work-handling and processing requirements needed to fit these operations.

All heat treat processing carried out in the new furnace equipment uses an endothermic type atmosphere base gas produced by an Ipsen electrically heated endo generator. The generator is fully automatic. Natural gas and filtered room air are used as the reaction mixture.

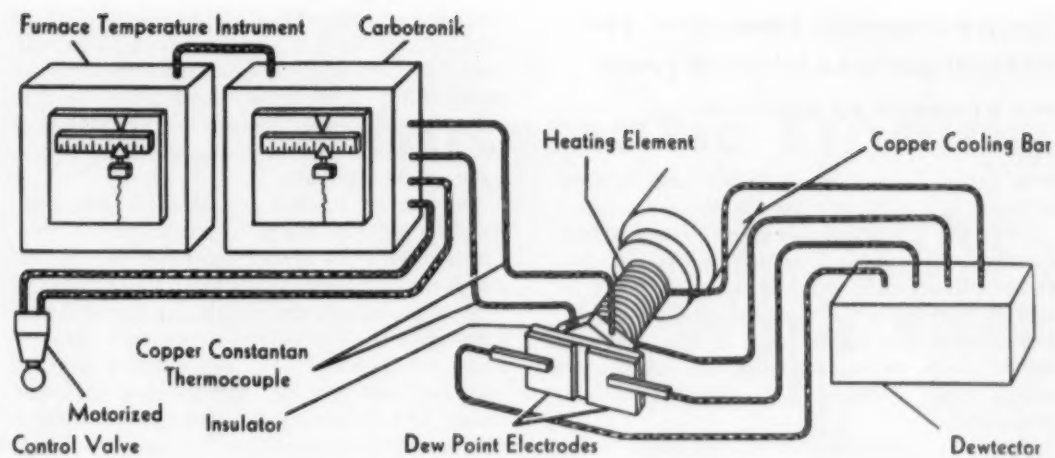
Generator is versatile

The generator is provided with electric coils for heating the high temperature reaction tube. Generator gas is produced at the rate of 475 cu ft per hour. Processing requirements take care of about 400 cu ft, and the remainder is burned off. Under certain conditions, this generator can be operated at 50 pct of rated capacity and still produce a stable endothermic gas.

Carburizing follows a basic pattern for both 8620 and 1020 steel parts. With the Carbotronik set at 0.80 pct carbon, all parts are held at 1700°F for three hours. The parts are then direct quenched into warm oil (150°F). Liquid cleaning together with a tempering operation follow.

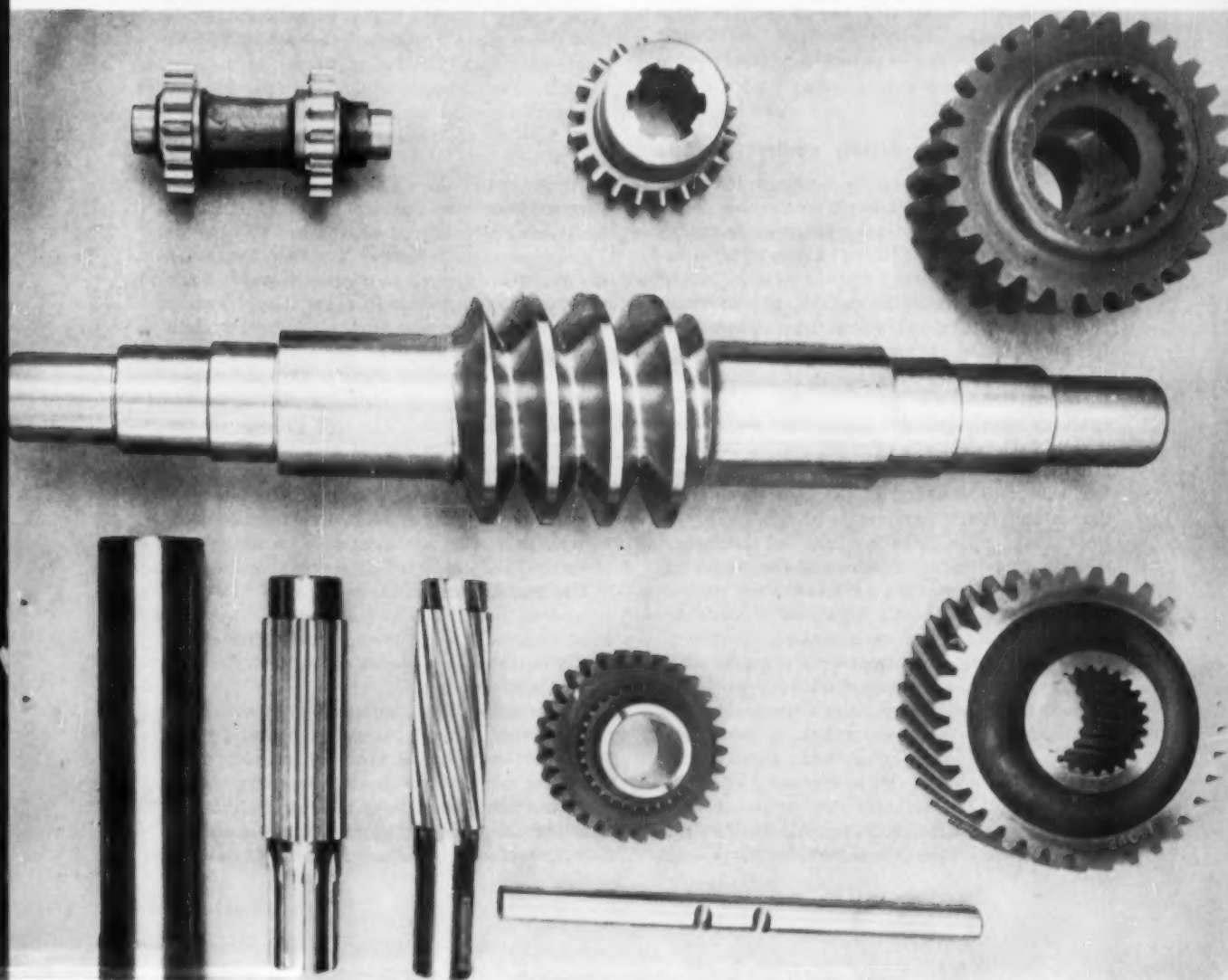
For straight hardening of the medium-carbon grades, 8640 and 1040 parts are held at 1600°F for one hour. The Carbotronik is set at 0.40 pct carbon to provide a neutral protective atmosphere and prevent possible decarburization.

After an hour at heat, the parts are quenched into somewhat warmer oil (175°F) and tempered to required hardness. As a rule, the hard-



Above: SCHEMATIC diagram of carbon control system used successfully on batch-type furnaces.

Below: WORM GEARS, shafts and other SAE 8620 and 1020 steel parts heat treated at Tulsa Winch.



Fully automatic generator uses natural gas and filtered room air as reaction mixture . . .

ness range desired is 45-50 RC and can be achieved by an 800°F draw for two hours.

This same furnace is also used for normalizing forgings. The same base atmosphere is used along with an enriching hydrocarbon. Work is held at 1600°F for the time required. It is then cooled under atmosphere in a cooling chamber located above the quench tank. Uniformity of cooling rates produces a properly normalized structure.

From the standpoint of carbon control, the Carbotronik controller has proved to be both accurate and highly versatile. It is particularly efficient for batch-type equipment applications. Efficiency under these conditions results from a special interlock between the carbon controller and the furnace temperature control instrument that regulates heat input.

For any given carbon potential, dew point tends to increase directly as the temperature decreases. Thus, to maintain a constant carbon potential, any variation in temperature requires an adjustment of dew point. Handled automatically, a special device on the temperature controller shifts the dew point along with the furnace temperature.

Rigidly controls carbon

The result is a constantly corrected dew point that can be read directly in per cent carbon potential. This eliminates converting dew point to carbon potential every time a change in temperature occurs.

The new controller is capable of automatic correlation of furnace temperature and dew point for any desired carbon potential between 0.20 and 1.25 pct carbon regardless of temperature variation during the heat treating cycle. The operator merely sets the instrument dial to the desired carbon potential and the rest of the operation is completely automatic.

A schematic drawing of the basic circuits of the carbon control system is shown on p. 77. Note that the system contains all necessary recording equipment. Sections of the recording charts taken from runs at Tulsa show carbon potential maintained at a high level of uniformity throughout the heat treat cycles.

The recording instrument does not provide a straight or curved line record but rather a high-frequency oscillation type record. Individual determinations are made automatically every five seconds. This fluctuation serves to point up the extreme sensitivity of the instrument. The continuous record is a valuable shop control means.

Close control is vital if uniform mechanical properties are to be guaranteed for each heat

treated gear, regardless of the size of load or surface area of the parts involved. The most important advantage of automatic carbon control is its ability to invariably compensate for such variables as furnace temperature, condition of the atmosphere generator, and alteration of dew point at the generator.

The overall furnace operation is also completely automatic and is set up to work in conjunction with the carbon controller and the atmosphere generator. When the furnace temperature is as desired, the circulating fan shuts off automatically. The outer furnace door opens to admit the work tray. The loader then pushes the tray into the heating chamber and the door closes. The circulating fan then turns on to provide better uniformity.

Furnace cycles automated

After 2.5 minutes, the Carbotronik sample pump begins the operations of sampling and controlling. At this point, the recorder also starts operation. The operator sets a cycle time for the actual furnace cycle and another instrument to control quench oil flow and time in the quench bath.

At the end of the furnace cycle, an indicating light comes on. The inner furnace door opens and the work is moved into the quenching compartment onto an elevator platform. As the inner furnace door closes, the elevator descends with the work into the quenching oil. The furnace is now able to accept another work tray at the intake end.

At the end of the quenching cycle, a rear door near the quenching platform is opened and a protective flame curtain is automatically turned on. The hardened parts are removed from the quench elevator and delivered to a run-out table. A conveyor carries the work to a hot, liquid washer. Time in the wash solution is also timed mechanically.

In order to obtain satisfactory atmosphere control an absolutely air-tight furnace is an essential at all times. The new furnace is completely sealed at the charge and discharge ends of the heating chamber and also in the vestibule above the quench tank. Seals are incorporated in each of these inner and outer furnace doors as well as at the discharge door on the quench chamber.

The heating chamber is insulated by 11 in. of insulating fire brick and refractory material. Positive circulation of atmosphere in this chamber is provided by a slow-starting motor with a water-cooled bearing.

The propeller type fan circulates the atmosphere upward through the charge basket or load. This provides optimum circulation and assures maximum contact of furnace atmosphere to all surfaces of the parts being treated. Baffles surrounding the work load can be arranged to provide atmosphere circulation patterns as desired.

Boost output tenfold—

Automatic Tinning Makes Repair Work Easy

♦ Manual tinning of covers and plates was a bottleneck in a repair shop handling more than 100,000 gas meters annually . . . Unpredictable safety hazards were brought about by the tedious nature of the job.

♦ Now tinning progresses safely and automatically at 500 pieces an hour, 1000 pct higher than previously, with a special triple-operation machine . . . Flux and solder waste is less . . . All four edges are tinned simultaneously.

By **ROBERT G. WHITE**, President,
R. G. White Mfg. Co., Ozone Park, N. Y.

♦ **SYNCHRONIZED** operation of an automatic fluxing, tinning and wiping machine has increased production 1000 pct and eliminated a production bottleneck in the gas meter repair section of a major utility. The one-man machine turns out gas meter covers and plates at 500 an hour, fully tinned and ready for reassembly.

With previous manual tinning methods, 50 covers and plates were processed an hour. The repair department at Brooklyn Union Gas Co., Brooklyn, now is completely mechanized and overhauls more than 100,000 gas meters yearly.

This 1000 pct production increase is achieved with less waste flux and solder. Thorough tinning of all edges is simultaneous. Subsequent spray-painting of the meter is simplified by absence of rough solder on surfaces.

Formerly, tinning was entirely a manual operation. Each worker faced a U-shaped trough filled with molten solder. After painting four edges of the case with flux, he dipped one edge at a time into the trough.

Edges then were wiped with waste cloth to remove excess solder. At least 1½ minutes were required to flux, tin and wipe each case.

Disadvantages of this earlier procedure were manifold. The wiping action invariably left

an unsightly ridge of solder on the case, advertising the fact that the meter was repaired. The workers continuously handled hot solder, always a potential safety hazard. Once a worker's gloves were soaked with flux, there was the possibility of injury to the hands through penetration of heat. In this overhaul operation, high worker safety standards were particularly difficult to maintain because of carelessness induced by the repetitive nature of the job. Despite an excellent hooded ventilating system, a certain amount of smoke and heat was unavoidable in the operation, making it unpleasant.

Scoured with alkaline cleaner

All these detriments have been eliminated by the new tinning machine, designed and developed by R. G. White Mfg. Co.

Meters are brought into the department for repair after service of not more than seven years. They are first sent through a ground floor washing machine on an overhead monorail conveyor. This machine sprays the meters with a straight caustic-type liquid cleaner that scours exterior surfaces to remove dirt, grime and paint.

From the washing machine, the meters proceed on the overhead conveyor to the third



DEGREASED gas meter cases feed into automatic tinning machine at 500 an hour. Conveyor carries

parts through synchronized fluxing, tinning and brush-wiping. Air-cooling follows.

floor. Here a worker either places them in temporary storage or loads them on shop trucks for dismantling and repair on the fourth floor.

On the fourth floor, meters are opened on specially designed, gas-fired burner opening machines. The first step is removal of the tops. A worker purges the meter interior with carbon dioxide to minimize possibility of fire. He positions the meter against the burner which melts the soldered joints in about 18 seconds. Tops are knocked off and dropped into a slot in the bench that leads to a storage box.

Meters are pushed along the bench to another worker who quickly melts off the valve box cover plates with a nine-tipped gas burner swung down against the plate.

The meters travel 8 ft on a gravity conveyor to the case removal operation. The operator inserts a forked prong into the valve ports of the meter to admit a blanket of CO_2 . The case removing machine is actuated by compressed air and slides two rectangular ribbon-type gas burners into place on opposite sides of the meter. In approximately 21 seconds, the solder holding the cases to the meter melts. The operation is so effective the cases are ready to fall off when the meter is removed from the machine.

When a quantity of tops and cases is accumulated, a hand truck transports them in wire baskets to a caustic-type degreaser. Each basket holds about 20 pieces and is fed into the degreasing machine by an overhead monorail conveyor. The washing solution consists of water and liquid caustic soda in an 8:1 ratio.

Cases and tops are soaked in the tank for 15 minutes at 200°F. After the soak they pass on the same conveyor to a cold water spray rinse of three to four minutes.

Conveyed by magnets

Dried tops and cases are hand-trucked to the tinning machine. The operator is required only to load parts into the machine from stacks in front of him. Several sizes of meter tops or cases can be fed into the machine interchangeably by making a slight adjustment on a take-up wheel provided for the purpose.

In the tinning operation, the case is positioned on a loading table which then rises several inches vertically. The table halts momentarily at elevation to allow the case to be caught by a permanent magnet connected to the main conveyor chain. The case is conveyed a short distance for preheating over a series of small gas burners.

Next step is fluxing in a water solution of zinc chloride. The case rests over the cast iron flux pot while a narrow ladle filled with liquid flux rises and immerses four edges of the case simultaneously. Fluxing completed, the ladle lowers into the pot. Excess flux is allowed to drain off the case before it continues to the tinning stage.

Tins four edges at once

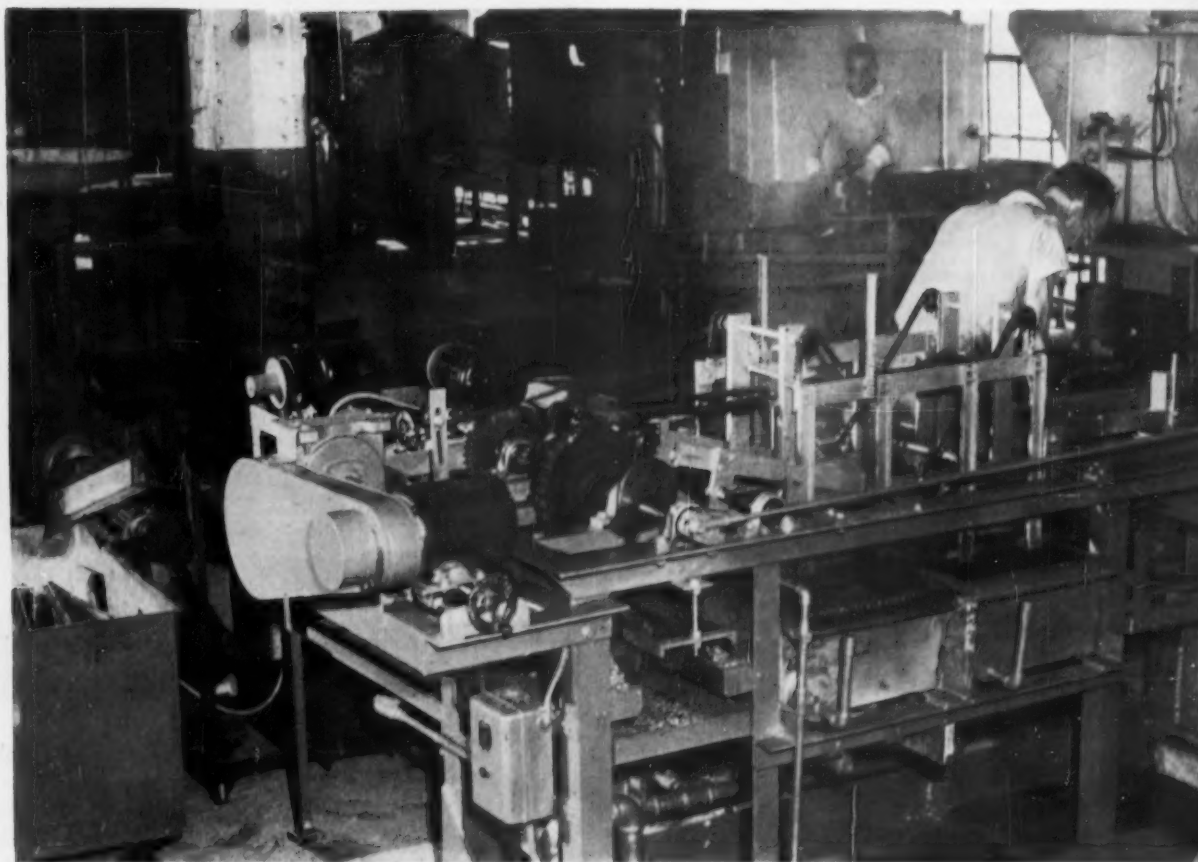
In tinning, the case again is held stationary on the main conveyor while a ladle filled with hot liquid solder (50 pct tin and 50 pct lead) rises from the cast iron solder pot and thoroughly tins all four edges. As the ladle lowers, excess solder drains off.

Ladles for fluxing and tinning are raised and lowered in synchronized flow with the main conveyor speed rate. Just prior to positioning of the case over each cast iron pot, the ladles dip down once for loading of flux or solder.

Solder is liquified with two gas burners directly beneath the pot. A drain in each pot facilitates removal of material and cleaning when required.

After tinning, two pusher arms on the first of two cross conveyors release the case from its magnet. The cross conveyor carries it past burners and beneath two high-speed tampico brushes that wipe off excess solder and polish the surfaces on two edges. Following this, the case is ejected onto a second cross conveyor. It passes beneath another set of burners and brushes which duplicate the wiping and polishing action on the remaining two edges of the case.

At the end of this second conveyor, the case is discharged onto an inclined conveyor. On this last run the case is automatically cooled with a high pressure air blower. This chills the solder so the cases will not stick together as they are stacked in a shop cart.



FLUX pot (far right) catches drips from shallow fluxing ladle. After solder dip (adjacent to flux pot),

meter case is cross-conveyed to dual brush-wiping process, later (at far left) ejected to truck.

New Flux Simplifies Brazing of Chrome Carbide

♦ **BRAZING** of sintered chromium carbide in air without special equipment is now economically practicable with a flux containing powdered boron. Earlier efforts to braze this carbide on a production line basis proved exceptionally difficult and expensive because of the tough chromium oxide film which formed over the surface.

Boron-containing flux efficiently reduces the oxide coating. It promotes good wetting and bonding between cemented chromium carbide and several commercially available silver alloy filler metals. Best results are secured with a combination of borated flux and a special silver alloy filler metal composed of 57 pct Ag, 33 pct Cu, 7 pct Sn, and 3 pct Mn.

The new technique is expected to pave the way toward wider use of cemented chromium carbide in applications around the 600°F range. The carbide alloy could not be used before in that temperature zone for lack of a suitable joining method.

Cemented chromium carbides have previously been successfully brazed in an atmosphere of pure, dry, hydrogen, or by using filler metals of high silver and manganese content. Such methods have not been adaptable to economical production because special care is required when the high-nickel sintered face of the chromium carbide is removed.

The following procedure for brazing cemented chromium carbide has been developed by Carboloy Div. of General Electric Co. in cooperation with Handy & Harman.

1. Sandblast the chromium carbide and other steel surfaces to be joined.
2. Clean surfaces with a suitable solvent. Flux pieces with suitable borated flux.
3. Assemble the pieces in a jig or work holder. Preplace the brazing filler metal in the joint. Apply additional flux to restore the continuous coating if necessary.

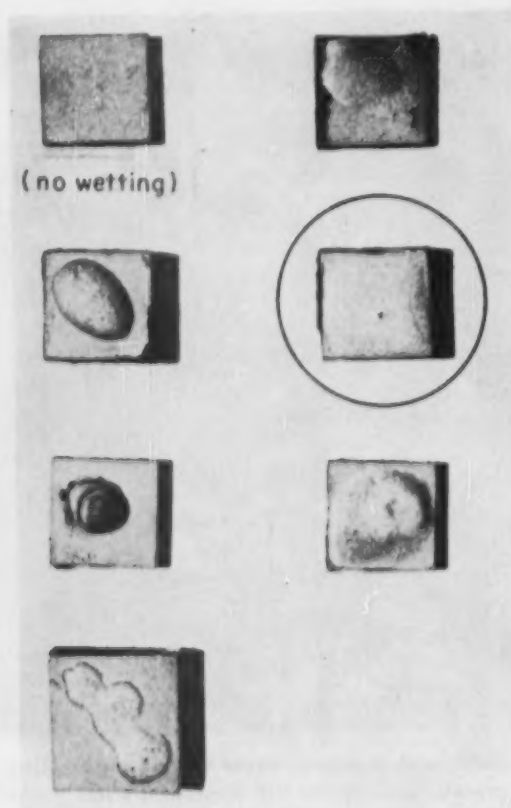
When brazing chromium carbide to steel, it may be necessary to first "tin" the surface of the chrome carbide with the filler metal. If so, heat the carbide carefully on the surface opposite the tinning surface, using a reducing flame. Heat the metal as rapidly as possible to a temperature just exceeding the flow point of the filler metal. Take care to prevent localized overheating.

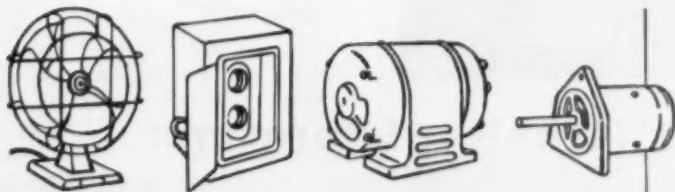
4. Heat the joint to about 1450°F, or 100°F above the flow point of the filler metal, whichever is higher. This superheating assures good wetting of the chromium carbide. With torch heating, use a slightly reducing flame. Apply flame to the steel part of the assembly. If the flame is applied directly to the chromium carbide, avoid overheating the flux.

5. The chromium carbide should be "puddled," if possible, or moved around slightly, when brazing temperature is reached. This helps eliminate entrapped pockets of gases or flux.

WETTING ABILITY of various fluxes and silver alloy filler metals compared in brazing chromium carbide. Borated flux is superior.

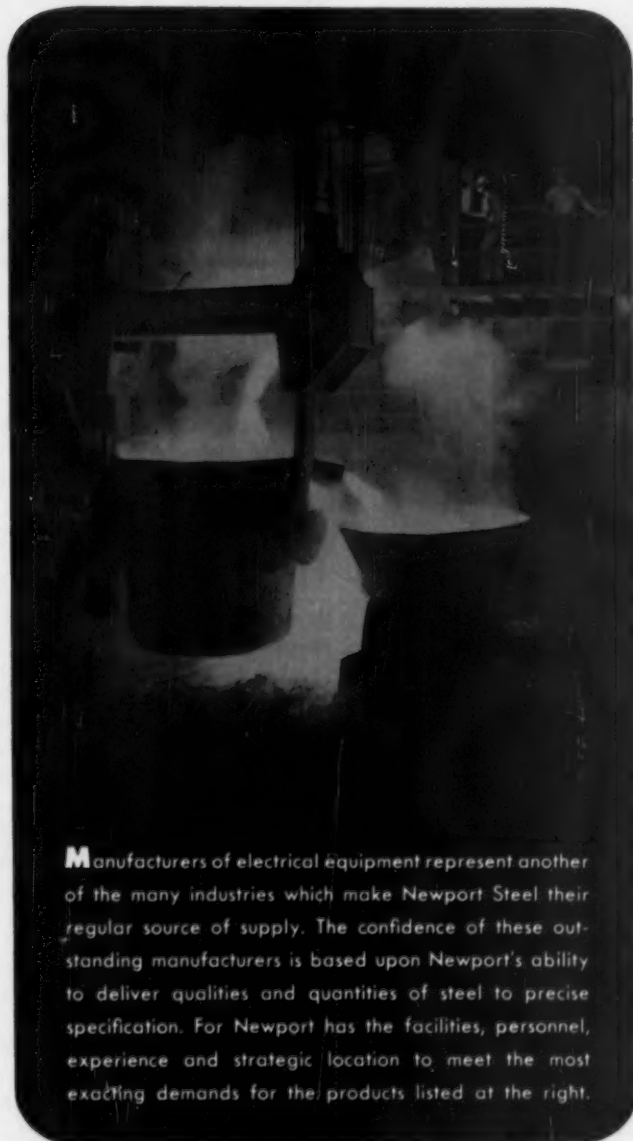
LEFT column (general purpose flux), read down: a) BAg-3 filler metal at 1450°F, b) proprietary filler—1450°F, c) proprietary filler—1650°F, d) BAg-Mn filler + HT flux—2100°F. **Right column** (special borated flux), read down: a) BAg-3 filler—1450°F, b) proprietary filler—1450°F, c) proprietary filler—1650°F. Encircled specimen fluxed with boron.





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New Technical Literature:

Notching presses

A complete line of notching presses and attachments is described in a new 16-page illustrated catalog. The booklet contains detailed press and fixture specifications for notching machine models, 2 types of segment notchers, a slotting machine, and a band punching machine. Fixture specifications include spindle-type and ring-type fixtures for both rotor and stator applications. Attachments described and illustrated include a skip notching attachment, an automatic blank feeder, and an index ring fixture. *The V & O Press Co.*

For more data circle No. 1 on postcard, p. 89

Rotary table

A folder describes a 42 in. plain rotary table provided with automatic indexing. Features of the unit and specifications are included. *Pratt & Whitney, Div. of Niles-Bement-Pond Co.*

For more data circle No. 2 on postcard, p. 89

Testing

New Bulletin P-196, describes a series of projectors for industrial radiography with gamma rays which are available in three sizes and offer a choice of radioactive isotopes of different intensity. The 4-page, 2-color bulletin explains how the portability, safety, versatility and economy of new gamma ray equipment expands the range of applications in which radiography may be used as a practical, economical tool for non-destructive testing. *Metal & Thermit Corp.*

For more data circle No. 3 on postcard, p. 89

Nickel-tin-bronzes

A 28-page booklet recommends types of nickel-tin-bronzes for constructional, bearing and pressure castings, and explains cross-over applications. Text, tables, graphs and photos give engineering properties and applications. *The International Nickel Co.*

For more data circle No. 4 on postcard, p. 89

FOR YOUR COPY

Money-saving products and services are described in the literature briefed here. For your copy just circle the number on the free postcard, page 89.

Die springs

A complete line of die springs is illustrated and described in a 12-page brochure just issued. The brochure describes the development of the new line of die springs in three distinct pressure groups and over 500 standard sizes. Performance statements, complete specifications and dimensions, as well as spring illustrations are included. *Die Supply Div., E. W. Bliss Co.*

For more data circle No. 5 on postcard, p. 89

Furnaces

A new technical bulletin describing furnaces for the heating and heat treatment of aluminum and other light metal alloys from the ingot to the finished product has just been issued. This bulletin covers all types of furnaces, both batch and continuous, including soaking pits, coil annealers, continuous process roller hearth furnaces, batch type units for heat treating, and melting, as well as investment casting. Important new data on extremely rapid heating with high speed convection is also presented. *Surface Combustion Corp.*

For more data circle No. 6 on postcard, p. 89

Steel joists

A new 20-page bulletin gives description and states properties and advantages of lightweight open web steel joists for floor and roof supports. Design data and load tables are included as well as illustrations of accessories and installation data. *Joseph T. Ryerson & Son, Inc.*

For more data circle No. 7 on postcard, p. 89

Condensers

A new bulletin, Form 9012-A, describes barometric steam condensers of the disc-flow and ejector-jet types. The disc-flow type is recommended for any barometric steam condenser application. The ejector-jet type is described as a simplified design suitable for use where the quantity of non-condensables is moderate and relatively clean cooling water is available. These units are supplied in sizes to 120 in. diam that handle up to 12,000 gal of cooling water per min. *Ingersoll-Rand Co.*

For more data circle No. 8 on postcard, p. 89

Couplings

Couplings designed to solve power transmission problems are discussed in a new booklet. The advantages of the company's line are described and pictured, while a number of case histories of power transmission problems are also included. *American Flexible Coupling Co.*

For more data circle No. 9 on postcard, p. 89

Stainless steel

A new data sheet on Chromium-Nickel-Molybdenum Stainless Steel types 316, 316L, 317 and 317L is now being distributed. The new data sheet gives detailed information on the various mechanical and strength properties of these steels. *Allegheny Ludlum Steel Corp.*

For more data circle No. 10 on postcard, p. 89

Heating

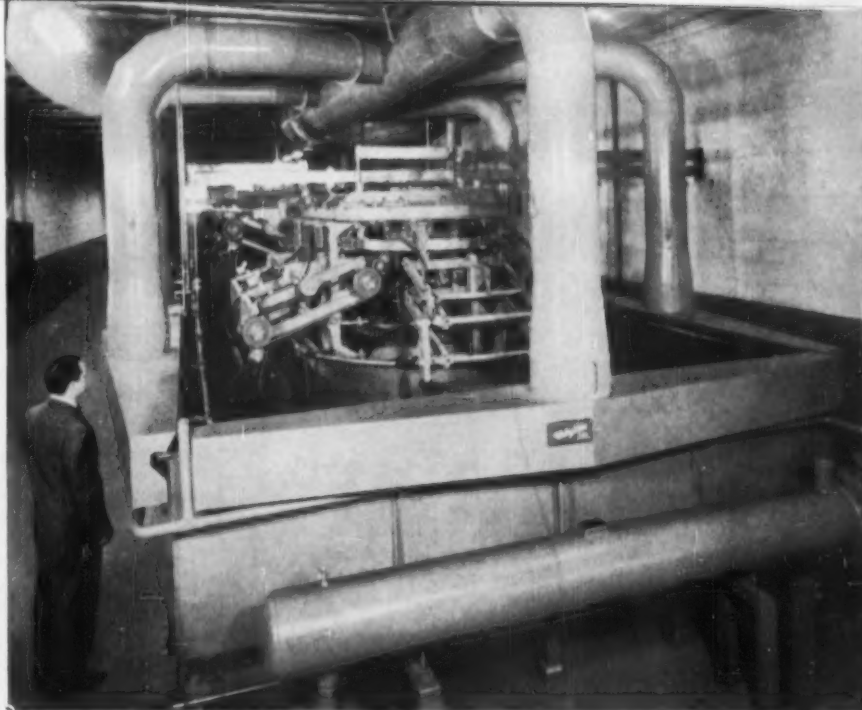
A descriptive bulletin on the general purpose scanner (Type GP) for scanning or single-shot heating of work pieces up to 30-in. long, 10-in. diam is offered. The bulletin explains the induction heat treating of a large variety of work. *Westinghouse Electric Corp.*

For more data circle No. 11 on postcard, p. 89

Radiography

A 2-color brochure describing "A New Approach to Supervoltage Radiography" has just been published. *Bulletin R* is a treatment of the importance of radiography as an inspection and quality control tool. Presented is a checklist of the major characteristics of supervoltage radiography. *High Voltage Engineering Corp.*

For more data circle No. 12 on postcard, p. 89



NEW TOP EFFICIENCY IN BARREL PLATING

Udylite Automatic Barrel Proves Its Flexibility and High Capacity in Actual Production

The new Udylite full automatic horizontal barrel plating machine is a heavy duty, high production, return type unit, designed and built for any standard plating process.

Now in production plating, this new machine incorporates Udylite's years of experience as a foremost horizontal barrel producer plus Udylite's fully automatic engineering genius.

Special features include delayed set downs and skip transfers with complete operational control by the operator. Each cylinder can be raised or lowered independently of the rest. Electrical controls pre-determine desired number of cylinders per hour and time of cylinders in each bath. Speeds can be reduced in the post plate cycle. These and other features mean unheard of operational flexibility.

Get more facts about this new Udylite automatic barrel plating machine. Write for literature today or contact your local Udylite representative.

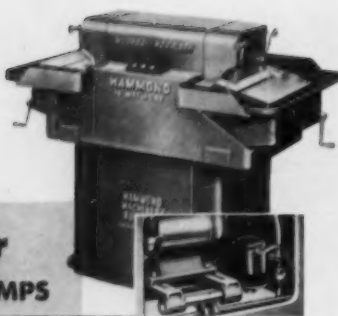
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The compact, simple design of all Gusher Coolant Pumps assures you of maximum performance in a minimum of space. Wherever you mount it, a Gusher Coolant Pump is ready to go to work. There's no priming necessary, you get instantaneous coolant flow.

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Illustrated is a Hammond Model 14-WD Wet or Dry Carbide Tool Grinder — the inset shows a Gusher Coolant Pump mounted inside the base.

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Producers of fine tool steels — All types immediately available through Sales Offices, Warehouses and Representatives in Principal Cities.



FREE TECHNICAL LITERATURE

Inclinable presses

Double crank inclinable presses, including a newly-designed line of enclosed double cranks with box-type crowns, are illustrated and described in new catalog. Specifications for standard and special features are described, and complete dimensions are listed. The catalog also gives detailed descriptions of such features as air-friction and rolling key clutches, cast Meehanite frames, die cushions and automatic feeds. *E. W. Bliss Co.*

For more data circle No. 13 on postcard, p. 89

Refractory lining

A multiple - page mailing piece printed on aluminum foil has been prepared which describes Brikrum-80, a refractory material for lining furnaces used in melting and refining aluminum. The mail piece explains in brief the services offered by the manufacturer to the aluminum industry and lists other products made by the firm. *General Refractories Co.*

For more data circle No. 14 on postcard, p. 89

Company profile

"This is Inco's Huntington Works," is the title of a 48-page book which describes with text, pictures and drawings the varied operations of a company plant. Sections are given on handling of nickel ore, refining, quality control, milling and chipping, forging, rolling, making sheet and strip, heat treating and rolling for hardness, extrusion, cold drawing, tube making machining, as well as research and engineering services. A list of the company's various nickel alloys is included in the book, together with a breakdown on their industrial applications. *International Nickel Co., Inc.*

For more data circle No. 15 on postcard, p. 89

Dehumidifiers

A new 20-page, 2-color illustrated catalog (Bulletin 7827) describes a line of new central station type sprayed coil dehumidifiers. The catalog features a special 10-page section of application data, which discusses pertinent factors relating to selection and use. *American Blower Co.*

For more data circle No. 16 on postcard, p. 89

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Meets every requirement for modern product design and fabrication. Excels in accuracy, ductility, hardenability, finish, high fatigue value, and uniformity.

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FREE TECHNICAL LITERATURE

These publications describe money-saving equipment and services . . . they are free with no obligation . . . just circle the number and mail the postcard.

This section starts on page 84

Electric furnaces

Specially designed electric furnaces for heat processing are described in a brochure. Types include mesh belt, pusher type, bell, elevator, pit, car bottom, box, continuous wire and strip annealer, roller hearth, and rotary hearth. *Harper Electric Furnace Corp.*

For free copy circle No. 17 on postcard

Die casting

A new series of die casting machines, featuring a basic machine expandable for future needs, is described in a brochure. Specifications, pressures and capacities are given for both aluminum, magnesium and brass models and for zinc, lead, and tin models. *Lake Erie Engineering Corp.*

For free copy circle No. 18 on postcard

OBI presses

Bulletin 56 describes a series of open back inclinable presses from 75 to 200 ton capacity. Discussed is a new company design feature—an enclosed front-to-back crankshaft design—as well as other product advantages. Die space dimension drawings are included as well as specifications for the various models in the line. *Niagara Machine & Tool Works.*

For free copy circle No. 19 on postcard

Conversion tables

A new bulletin, "Standard Conversion Tables," F7255, gives thermocouple temperature-millivolt equivalents. Temperatures are expressed on the International Temperature Scale of 1948. The electromotive force is expressed in absolute units. *Barber-Colman Co.*

For free copy circle No. 20 on postcard

Hand forgings

Minimum mechanical property guarantees for many classes of hand forgings are charted in a new folder. Designed for use as a wall chart, looseleaf insert, or self-contained filed folder, the folder tabulates tensile and yield strengths and elongation percentages of hand forgings made from aluminum alloys 2014-T6 and 7075-T5 in various sizes up to 2000 lb in weight. *Kaiser Aluminum & Chemical Corp.*

For free copy circle No. 21 on postcard

Press brakes

A new catalog describing "Steelweld Press Brakes" has just been issued. Construction details are described and illustrated, with dimensions and specifications given for entire standard line of press brakes which range in bending capacity to 14 ft x 3/4-in. mild steel. *Cleveland Crane & Engineering Co.*

For free copy circle No. 22 on postcard

Die steel

New additional information on "Ontario-EZ Free Machining Air Hardening Die Steel," is contained in a data sheet now being distributed. *Allegheny Ludlum Steel Corp.*

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Inspection

Booklet details the problem of inspection and outlines methods for effectively using it to reduce production costs. Many case histories are included of typical uses of the company's equipment for inspection testing in metalworking. *Magnaflux Corp.*

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FREE TECHNICAL LITERATURE

Pumps

Engineering specifications and data on a line of hand-operated hydraulic pumps and heavy duty hydraulic cylinders are contained in a data sheet. Included are 4 pump models, with 2 and 3 speeds, and fingertip control valve. The hydraulic cylinder line includes a single-acting rack and pinion type cylinder; a single-acting spring return type cylinder; and a double-acting cylinder, with maximum operating pressures up to 5500 psi. *K. R. Wilson, Inc.*

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Wire construction

"How Wire Construction Reduces Costs," showing the use of wire in improved product design, is a study of 36 illustrated case histories. This new 11-page booklet covers a wide application range, including motor mounts, fan guards, furniture, building specialties, and television components. Descriptions of each before-and-after picture point up specific advantages of wire construction. *E. H. Titchener & Co.*

For free copy circle No. 26 on postcard

Hole punching

Bulletin G-1 illustrates and describes a new series of hole punching equipment for unitized tooling in presses and press brakes. This complete line of units permits punching round and shaped holes up to 1½-in. in diam in very thin material up to ¼-in. thick mild steel sheets, angles, extrusions, channels and various other shaped parts. *Punch Products Corp.*

For free copy circle No. 27 on postcard

Vacuum degasser

Bulletin No. 402 describes a new mobile vacuum degasser for purifying molten metals. The completely self-contained unit, said to be the first one commercially available, occupies less than 6 sq ft of floor space and rolls on wheels to any plant location. The brochure describes the component parts of the unit, dimensions and seven specific advantages it offers. *New York Air Brake Co.*

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FOR MORE LITERATURE

Many companies offer free literature and other information in their advertisements. For the names of these firms see the company listings in the index of advertisers.

Process equipment

An informative, 2-color, 16-page booklet uses photographs, line drawings, diagrams and brief text to describe 20 materials handling and special processing units designed and built for the railroad, ordnance, automotive, farm implement, electrical appliance and food industries. Featured in a 2-page, fold-out section is a diagram of a cylinder block production line—a typical example of production line engineering. It shows how 16 of a company's work-handling and processing units are incorporated into the development of a specific production line. *W. F. & John Barnes Co.*

For free copy circle No. 29 on postcard

Barrel finishing

Four classes of precision barrel finishing compounds are described in a new set of 4-page illustrated brochures. The compounds described are for a wide range of barrel finishing operations, from heavy deburring and cutting, to regular deburring, burnishing, and cleaning. In addition, rinsing and neutralizing compounds for between-stages operations are described. Useful guide tables for correct finishing of metals, plastics, castings and parts are included for each compound and fully describe types of parts, amount of compound, type of media, amount of water, and finishing time. *Newton Industries Inc.*

For free copy circle No. 30 on postcard

Thermocouples

A catalog gives specifications and price data on thermocouple assemblies, pressure sealing glands, sealants, and insulators. Accompanying data covers features, models, types and selection. *Conax Corp.*

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P. A. STAPLES

Portrait by Fabian Bachrach

"Hershey Employees cited for Payroll Savings Plan..."

"We, the officials and employees of the Hershey Chocolate Corporation of Hershey, Pennsylvania, are proud of the citation recently presented to us for outstanding participation in the United States Treasury's Payroll Savings Plan for the purchase of Savings Bonds.

"We all realize fully the importance of sound money to the economy of our country and our community. I

wholeheartedly recommend that all business executives activate this plan in their respective companies."

**P. A. STAPLES, Chairman of Board and President,
Hershey Chocolate Corporation**

If your company has the Payroll Savings Plan, your State Sales Director will be glad to help you organize a Person-to-Person Canvass that should increase employee participation to 50%, 60% or more. If you do not have the Plan, he will show you how easy it is to install one. Write to Savings Bond Division, U. S. Treasury Department, Washington, D. C.

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TECHNICAL BRIEFS

MATERIALS: Speed Roll Changes

Use of quick sealing couplings aids rolling
mill in connecting and disconnecting fluid lines easily
and rapidly . . . Leakproof service required.

Crucible Steel Co. of Midland, Pa., has found it can cut the down time required for changing the mill rolls to a minimum with the aid of a unique hose coupling manufactured by Titeflex, Inc. of Springfield, Mass. This problem of down time for roll change is especially troublesome at Crucible's Midland mill, which rolls stainless steel to a mirror finish so it can be used directly as automobile trim or mirror frames. Work rolls have to be changed as soon as the roll surface shows the slightest deterioration due to wear.

Fluid Lines Slow Change

To keep the down-time loss from such frequent shutdowns reduced to a minimum, replacement rolls are kept in reserve alongside each mill. The mills are designed to make roll change as rapid as possible and crews remove a roll and replace it with another in a short time. However, one difficulty often bogs down the whole operation—the coupling and uncoupling of fluid lines connected to the rolls.

Space and Fittings Problem

In the mills used by Crucible at its Midland plant, these fluid lines were originally connected to the roll blocks by threaded fittings, which had to be disconnected every time a roll was removed and had to be reconnected when a new roll was installed. This proved to be the bottleneck in the roll changing operation because the cramped space and surrounding projections made the use of a wrench, to loosen or tighten these fittings, very difficult. In addition, the hydraulic fluid lines for the lifting jacks carry oil at high pressure (850 psi), so the threaded fittings for these lines

WANT MORE DATA?

You may secure additional information on any item briefed in this section by using the reply card on page 89. Just indicate the page on which it appears. Be sure to note exactly the information wanted.



Quick sealing couplings on fluid lines speed roll changing.

required extreme tightening to make them leakproof.

Crucible decided to use quick-connect and disconnect couplings in the fluid lines connecting to the rolls. The coupling had to be leakproof the instant it was connected and had to remain leakproof under high pressure, to avoid the safety hazard of oil leakage, and the coupling had to permit full swiveling of the flexible hose about the stationary pipe fitting, to avoid hose twisting and eventual breakage. It had to have rapid, simple connecting and disconnecting action, to make hydraulic line connecting and disconnecting fast and easy for the busy roll-changing crew.

In the coupling selected there is a ring seal which abuts against the nipple when the coupling is

TECHNICAL BRIEFS

closed, thereby making a tight seal as soon as the coupling is connected. When fluid is in the line it expands the lips of the seal, making the coupling leakproof at high pressures.

Methods:

Heat lamps keep spindles at work temperature

Technicians at the Plymouth engine plant found they were losing production each initial shift hour in the finish boring of cam and crankshaft main bearing holes in their V-8 engine block until friction brought boring spindles to proper temperature.



Eliminating "cold" spindles, heat lamps are production aid.

Bored to the close tolerance of 0.0005 in. the holes were gauging too small. Plymouth engineers then installed heat lamps 3 feet above the boring spindles to keep them at a temperature comparable to that of production line engine blocks. Now all finish cam and crankshaft bearings are measuring to tolerance.

Inspection:

X-ray unit speeds seam testing

An X-ray unit is frequently being used to inspect 2500-3000 welds a week while working a 24 hour per day schedule. The unit, manufactured by the North American Philips Co., is being used at the Delta Tank Mfg. Co., Inc. Plant at Baton Rouge, La. It uses a high-current tube that can be operated



Sometimes in use 24 hours a day, X-ray unit inspects weld seam.

at constant potentials up to 150 kv and at currents up to 20 ma.

Another for Girth Seams

In the photo, the unit is set up to X-ray a longitudinal seam. Film is taped inside the tank. A different tube, called a rod anode unit, is used for girth seams which are checked with one exposure. On such work, film only 2 3/4 in. wide is employed.

WEBB PLATE FABRICATING MACHINERY

Steelworkers ALL STEEL CONSTRUCTION

The Webb Corporation, in presenting the line of new WEBB STEELWORKERS, has designed versatile machines for either job-work or high production work. These units have been engineered to meet the particular need of shops having a variety of work, with a result that all-purpose machines are now available.

Five Complete Tools are Incorporated in a Single Unit.

1. Punch for plate, bars or structurals.
2. Cuts angles and tees with straight or miter cut.
3. Cuts off round and square bars.
4. Shears plates and bars.
5. Coping or notching attachment.

One of the main features of these machines is that they are at all times in complete readiness to do any of the above operations and to do the work well.

The punch may be operated at the same time as either the section cutter, bar cutter, shear or the coping and notching attachment . . . therefore, two operators can work at this machine simultaneously without interference. For illustrated literature and prices, write Dept. E.



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NEW EQUIPMENT

New and improved production ideas, equipment, services and methods described here offer production economies... for more data use the free postcard on page 89 or 90



Electronic sequence programmer for lathe use

Key unit of a numerical sequence programmer for automatic work cycles on a lathe is an electronic control panel. It incorporates simple push-type selectors which are used to preset the various operations desired from the machine for the particular work piece to be turned. Once sequence is programmed, starter button sets in motion up to 5 automatic work cycles using

as many as 5 varied spindle speeds and 5 different feed rates. Changing the programmer to another operating sequence only requires a revision of the control panel selectors. An air gage tracer used with the unit incorporates a dual template system, for tracer control on last rough cut and final finish cut. *Monarch Machine Tool Co.*

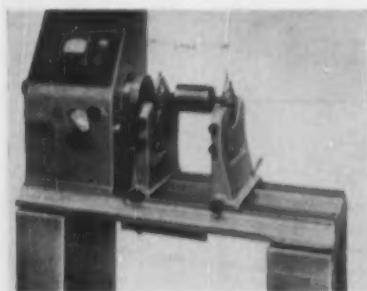
For more data circle No. 32 on postcard, p. 89

All-steel bending rolls have safety treadle

A series of 6 in. all-steel bending rolls, available in lengths of 48, 60, 72, 96 and 120 in., are of the initial or pinch type. Standard features include parallel adjustment of the rear or forming roll by a hand wheel in front of the machine and a safety treadle which extends the full length across the front. Step-

ping on the treadle immediately stops the machine. A single lever releases the drop-end which, when lowered, raises the upper roll. All 3 rolls are power driven with a 7½ hp, 1800 rpm motor which is completely mounted and wired. *Wysong and Miles Co.*

For more data circle No. 33 on postcard, p. 89



Balancing machines use piezo-electric system

Balancing principle in a new line of universal dynamic balancing machines utilizes a piezo-electric system. Rigid bearings with built-in piezo crystals are used in combination with a simplified electronic circuit for direct indication of amount and location of the unbalance. With this arrangement, operation is re-

duced to a single balancing run and adjusting a single control knob. Adjustment of the setup dials is accomplished in 2 to 3 min., according to the manufacturer. Machines are said to respond to 0.0002- to 0.0004-in. displacement of gravity center. *Testing Equipment Co.*

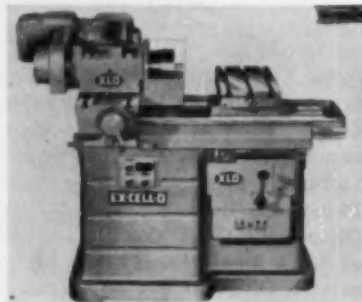
For more data circle No. 34 on postcard, p. 89

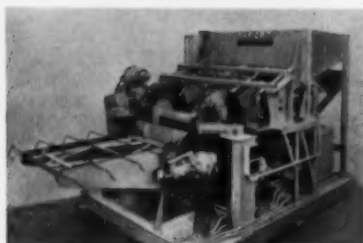
Borer provides wide variety of speeds and feeds

Designed to accommodate small and medium size workpieces, a precision boring machine has a 12 in. table travel. Its hydraulic control panel provides a wide variety of table feeds and speeds with minutely adjustable dials, controlling feed rates in both directions of table travel. Automatic compensating pressures assure smooth

table movements even during heavy machining resistance. Fast, rapid traverse; spindle brakes; permanently lubricated spindles; and automatically lubricated ways are provided. Precision spindles, isolated power assemblies and rigid base are designed for vibration freedom. *Ex-Cell-O Corp.*

For more data circle No. 35 on postcard, p. 89





Machine bends steel rods at high rate

A new, versatile, automatic bending machine which produces up to 2 bends in each end of steel rods at reported rates of 960 rods per hr is available. The machine has a mechanically operated rotary drum that indexes rods from a feed chute

to 2 bending stations. Bending dies powered by single-rotation, hydraulic rotary actuators produce outer and inner bends. Finish-bent rods are carried out of machine. *Expert Automation Machine Co.*

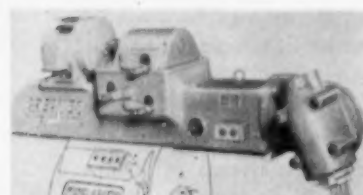
For more data circle No. 36 on postcard, p. 89

Leaf turnover, shuttle hand combined in feeder

Designed to feed heavy metal stampings to a trimming die, a new unit incorporating a shuttle hand and leaf turnover, receives a stamped panel, turns it over, then

automatically feeds it into the trimming die. Completely portable, the unit has an 84 in. feed stroke. *Hamilton Automation, Inc.*

For more data circle No. 37 on postcard, p. 89



Overarm attachment increases miller versatility

Two milling operations, one horizontal, one vertical or angular, may be performed simultaneously with a new attachment for a company's horizontal milling machine. Completely self-contained, this unit

consists of a heavy-duty overarm, universal milling head, motor and drive. It mounts on the machine and may be moved for positioning over work. *J. A. Fay & Egan Co.*

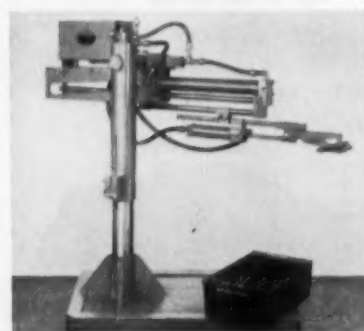
For more data circle No. 38 on postcard, p. 89

Rotary feed table has Meehanite cast index gear

An index gear, made of Meehanite casting, is provided on a new rotary feed table to save on production time. The table, either mechanically or air-operated, is reported to be at least five times faster than the average due to simplicity of design and the accurate

indexing. Outside diam of the standard size table is 15 in. and it can be supplied in any diam from 12 to 36 in. Index gear diam is 6½-in. x 1¾-in. thick. All pivot points are double seal bearings and bushings. *Bal-Aero Products Co.*

For more data circle No. 39 on postcard, p. 89



Press unloader is portable and adjustable

Incorporating a swiveling base, a press unloader is capable of being quickly moved from press to press and of being easily adjusted for different jobs. It is also recommended for use with back-geared presses where gearing prohibits the mounting of standard overhead unloaders. The unit, mounted on a heavy steel base with wheels, can be rolled into position. Once there,

it can be adjusted up or down on its vertical post to suit the die height and swiveled into unloading position. Since jaw travel is in a straight line, the unloader can remove small parts at high speeds. Its operation is similar to an overhead unloader except that the jaw travels in and out on a straight line. *Sahlin Engineering Co.*

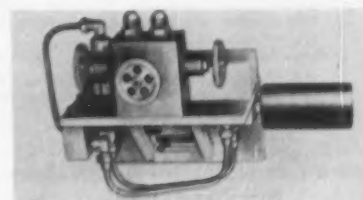
For more data circle No. 40 on postcard, p. 89

Pressure differences transmitted distances

New linear, force-balance instrument is available for pneumatically transmitting measurements of large pressure differences over standard distances. Capable of measuring full scale pressure differences up

to 300 psi, the transmitter is said to fill the measuring gap existing when the pressure differences exceed the capacity of standard instruments. *Hagan Corp.*

For more data circle No. 41 on postcard, p. 89





Do you really know the alloys you buy?

For instance, are you SURE of:

- **Heat identification** . . . not just type identification but the positive identification of your particular heat so you can be sure the alloy steel is everything it is supposed to be?
- **Chemical analysis** . . . not just the chemical range for the type, but the specific analysis of the heat from which your steel was rolled?
- **Hardenability** . . . not just the average hardenability for the type of alloy, but the actual test-proved hardenability of your particular heat of steel?

If you don't know these important facts, you may be in for trouble—loss of time and money; breakdown of equipment. It can happen when you're not sure of your alloys.

But when you work with Ryerson alloys you *can* be sure—sure of the steel you get, sure of what it will do—because Ryerson alloys are certified by an 8-step quality control program.

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CARBON STEEL BARS—Hot rolled & cold finished

ALLOYS—Hot rolled, cold finished, heat treated

STAINLESS—Alloyed bars, plates, sheets, tubes, etc.

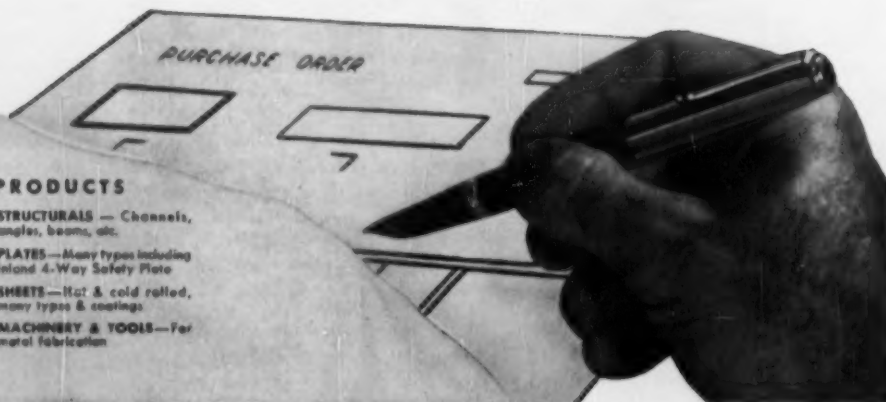
TUBING—Seamless & welded, mechanical & boiler tubes

STRUCTURALS—Channels, angles, beams, etc.

PLATES—Many types including Inland 4-Way Safety Plate

SHEETS—Hot & cold rolled, many types & coatings

MACHINERY & TOOLS—For metal fabrication



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The Iron Age SUMMARY . . .

Detroit cutbacks will not ease pressure on steel . . . Large producer warns customers against gray market sales . . . Structural supply critical . . . New output record.

The Auto Cutbacks . . . It will take more than a temporary letdown in auto production to ease the pressure for more steel. The cutbacks in Detroit will have no effect on the booming steel market.

Auto producers may be pulling in their horns on high cost conversion deals, but at the same time they're putting the screws on the mills for more tonnage at regular prices. Auto producers will continue to be heavy buyers of steel in 1956. If sales of '56 models do not go well, the auto companies will shut down early to push 1957 models.

The situation in steel is such that a large producer has warned its customers against channeling any of its stocks into gray market outlets. Any consumer caught selling to so-called "unorthodox" sources faces cancellation of orders still on this company's books.

This is the first time since Korea that any steel firm has felt it necessary to throw its weight against further growth of gray market activity, and represents another indication of just how desperate some fabricators are for steel.

Holiday Letdown . . . Although the mills are pro-

ducing at breakneck speed and will establish an all-time output record this year, there will be a slight letdown during the Christmas and New Year holidays. This will tend to increase backlogs and lengthen deliveries in first quarter of 1956.

Although foreign countries are fighting their own steel production problems, some of it is coming into the U. S. at fancy delivered prices. Some export brokers are booked into second quarter on plate, sheet, and structurals. Volume isn't high because foreign mills have little to spare.

The scarcity of structurals has put some equipment manufacturers behind on their commitments. Construction projects throughout the country are running late for the same reason. There will be no letup in structural demand through 1956. Indications are that fabricated structural shipments next year will set a new postwar record of 3.2 million tons. Two large fabricators reportedly are now sold out for '56.

The Operational Picture . . . Steel mills this week are expected to operate at 99 pct of capacity following last week's record-shattering pace when the operating rate hit a top level of 100.3 pct.

Steel Output, Operating Rates

Production	This Week	Last Week	Month Ago	Year Ago
(Net tons, 000 omitted)	2,388	2,420	2,388	1,785
Ingot Index (1947-1949=100)	148.5	150.4	148.5	111.0
Operating Rates				
Chicago	99.0	98.0	98.5	83.0
Pittsburgh	102.0	103.0*	103.0	70.0
Philadelphia	105.0	105.0	103.0	65.0
Valley	95.0	99.0	100.0	69.0
West	100.0	101.0*	101.0	62.0
Detroit	92.0	101.0	95.0	84.0
Buffalo	105.0	105.0	105.0	100.0
Cleveland	97.0	100.0	97.5	91.0
Birmingham	94.0	94.0	94.0	67.0
S. Ohio River	91.0	89.0	90.0	90.0
Wheeling	101.0	107.0*	105.0	67.0
St. Louis	105.0	107.0	109.0	63.0
Northeast	85.0	88.0	97.0	56.5
Aggregate	99.0	100.3	99.0	74.0

*Revised.

Prices At A Glance

(cents per lb unless otherwise noted)

	This Week	Week Ago	Month Ago	Year Ago
Composite price				
Finished Steel, base	5.174	5.174	5.174	4.797
Pig Iron (Gross Ton)	\$59.09	\$59.09	\$59.09	\$56.59
Scrap, No. 1 hvy (gross ton)	\$52.17	\$52.17	\$45.83	\$32.83
Nonferrous				
Aluminum ingot	24.40	24.40	24.40	22.20
Copper, electrolytic	43.00	43.00	43.00	30.00
Lead, St. Louis	15.30	15.30	15.30	14.80
Magnesium	33.25	33.25	33.25	27.75
Nickel, electrolytic	64.50	64.50	64.50	67.67
Tin, Straits, N. Y.	110.00	109.50	98.875	85.625
Zinc, E. St. Louis	13.00	13.00	13.00	11.50

Structural Demand Grows

Fabricated structural steel shipments will hit postwar high in '56 . . . Construction industry, highways are biggest customers . . . New prices again make the news.

♦ **FABRICATED STRUCTURAL** steel shipments in 1956 should hit a post-war high of about 3,250,000 tons. This comes close to the all-time record volume of 3,307,000 tons reached in 1929.

The promising prediction comes from the Building Materials & Construction Div., Business & Defense Services Administration, U. S. Department of Commerce.

In calculating next year's tonnage shipments, BDSA relates historical data on fabricated structural steel shipments to the construction activities of the product's biggest consumers: industrial buildings, warehouse, office and loft buildings, and highways.

These types of construction, it's estimated, take up around 80 pct of the total fabricated structural steel shipments.

Over the past eight years, the government agency has come close in its estimates of yearly total shipments. Actual shipments are gathered from the American Institute of Steel Construction.

Last year, for example, actual fabricated structural steel shipments came to 3,135,000 tons. BDSA's aggregate equation estimated shipments at 3,161,000 tons, a relatively slight differential of 26,000 tons.

Standard ferromanganese (74 to 76 pct Mn) has been increased by E. J. Lavino & Co. to 10.25¢ per pound f.o.b. Sheridan, Pa. and not 10.75¢ as reported earlier in THE IRON AGE.

The National Tube Division of U. S. Steel Corp. has reduced by approximately \$2 a ton the price levels of all standard and line butt weld pipe, sizes ½ to 4 inch.

A charge of 6 pct, however, is established for quantities of less than a ton of any item of standard

and line pipe, ordered for shipment in carload with other pipe, to one destination at one time.

Also, the company is withdrawing the 5 pct discount previously granted for standard pipe and Grades A and B line pipe, shipped to jobbers stocks or to plant locations of certain classes of pipe fabricators. The net result is a slight increase in prices.

SHEETS AND STRIP . . . The Stanley Works, New Britain, Conn., is upping its base price on cold-rolled spring steel in all categories from .26 carbon and up by 10¢ per 100 lbs. While the firm is not changing its base price on low carbon cold-rolled strip, it is adopting a new set of extras which will be applicable on shipments starting Dec. 16. Detroit Steel Corp. has revised its method of figuring prices on low carbon cold-rolled strip in cut lengths. Extras have been increased depending on the ordered width, gage and length. The mill has also increased the extra price on special quality low carbon strip \$2 a ton. **Chicago** sheet and strip orders are solid through first half of '56 which finds most customers already anxious about July and August deliveries. No extra tonnage is available

which means that unless a customer is on a quota delivery basis, he stands very little chance of getting sheet before next July. Heavy warehouse pressure on the mills for additional sheet and strip is having no success. Mill delivery carryovers range up to 120 days going into January. Hard-pressed hot-rolled sheet consumers in **Pittsburgh** will find this product even tighter to get hold of in the weeks ahead. One major supplier who stopped production of HR sheets a short time back isn't expected to resume shipments until the second quarter.

GALVANIZED . . . A relatively easy item to get hold of in **Chicago** with delivery carryovers running about three weeks. There is some inventory at both the mill and consumer level.

BARS . . . Customer pressure has started to ease slightly in **Detroit**. One producer reports order cuts for alloy bars from automakers running around 5 pct of earlier levels. Demand for carbon bars, however, is still heavy. Hot-rolled bar deliveries from **Chicago** mills are expected to be current at the end of first quarter '56. Rigid allotments on this product already are one reason some producers will catch up on their carryovers by that time. Free machining lead bars in the **Chicago** area will be in extremely tight supply through the first half. **Pittsburgh** mills have booked orders on all grades of bars through the first quarter. Producers expect to be current on deliveries by the end of first quarter. **West Coast** producers report increasing customer irritation at delayed mill deliveries on bars. Customers say they're having to turn work down because they can't get all the steel they need.

PLATE . . . This is a particularly strong conversion item in **Chicago**. The volume in plate conversion deals in the area has picked up noticeably over the past 30 days. At least a portion of this is European plate.

STRUCTURALS . . . Owing to a shortage of finishing facilities in **Pittsburgh**, delivery carryovers will command most of second quarter structural production. Net result is that hard pressed customers are seriously falling behind on their job commitments. Wide-flange beams continue in tight supply in **Detroit**. Little immediate relief is expected regardless of any cutbacks in other lines. Foreign structurals are reportedly hitting the **Chicago** area.

Purchasing Agent's Checklist:

RAW MATERIALS: Peru looks good as newest source of copper . . . p. 27

TAXES: There's still a hot debate on over fast tax write-offs . . . p. 29

STEEL: Austria shoots for strong comeback into world steel market . . . p. 36

PRODUCTION: Job shop volume is good, but profit margins are narrow . . . p. 55

TECHNICAL: Alloy plating adds new product appeal . . . p. 67

Comparison of Prices

(Effective Dec. 20, 1955)

Steel prices on this page are the average of various f.o.b. quotations of major producing areas: Pittsburgh, Chicago, Gary, Cleveland, Youngstown.

Price advances over previous week are printed in Heavy Type; declines appear in *Italics*.

	Dec. 21 1955	Dec. 14 1955	Nov. 22 1955	Dec. 21 1954
Flat-Rolled Steel: (per pound)				
Hot-rolled sheets	4.325¢	4.325¢	4.325¢	4.05¢
Cold-rolled sheets	5.325	5.325	5.325	4.95
Galvanized sheets (10 ga.)	5.85	5.85	5.85	5.45
Hot-rolled strip	4.325	4.325	4.325	4.05
Cold-rolled strip	6.29	6.29	6.29	5.79
Plate	4.52	4.52	4.52	4.225
Plates, wrought iron	10.40	10.40	9.50	9.50
Stain's C-R strip (No. 302)	44.50	44.50	44.50	42.00
Tin and Ternplate: (per base box)				
Tinplate (1.50 lb.) cokes	\$9.05	\$9.05	\$9.05	\$9.05
Tinplate, electro (0.50 lb.)	7.75	7.75	7.75	7.75
Special coated mfg. ternes	7.85	7.85	7.85	7.85
Bars and Shapes: (per pound)				
Merchant bars	4.65¢	4.65¢	4.65¢	4.30¢
Cold finished bars	5.90	5.90	5.90	5.40
Alloy bars	5.65	5.65	5.65	5.075
Structural shapes	4.60	4.60	4.60	4.25
Stainless bars (No. 302)	38.25	38.25	38.25	35.50
Wrought iron bars	11.50	11.50	10.40	10.40
Wire: (per pound)				
Bright wire	6.25¢	6.25¢	6.25¢	5.75¢
Rails: (per 100 lb.)				
Heavy rails	\$4.725	\$4.725	\$4.725	\$4.45
Light rails	5.65	5.65	5.65	5.35
Semifinish Steel: (per net ton)				
Re-rolling billets	\$68.50	\$68.50	\$68.50	\$64.00
Slabs, re-rolling	68.50	68.50	68.50	64.00
Forging billets	84.50	84.50	84.50	78.00
Alloy blooms, billets, slabs	96.00	96.00	96.00	86.00
Wire Rod and Skelp: (per pound)				
Wire rods	5.025¢	5.025¢	5.025¢	4.675¢
Skelp	4.225	4.225	4.225	3.90
Finished Steel Composite: (per pound)				
Base price	5.174¢	5.174¢	5.174¢	4.797¢

Finished Steel Composite

Weighted index based on steel bars, shapes, plates, wire, rails, black pipe, hot and cold rolled sheets and strips.

Pig Iron Composite

Based on averages for basic iron at Valley furnaces and foundry iron at Chicago, Philadelphia, Buffalo, Valley and Birmingham.

Steel Scrap Composite

Average of No. 1 heavy melting steel scrap delivered to consumers at Pittsburgh, Philadelphia and Chicago.

	Dec. 21 1955	Dec. 14 1955	Nov. 22 1955	Dec. 21 1954
Pig Iron: (per gross ton)				
Foundry, del'd Phila.	\$63.50	\$63.50	\$63.50	\$61.19
Foundry, Valley	59.00	59.00	59.00	56.50
Foundry, Southern, Cin'ti	62.93	62.93	62.93	60.43
Foundry, Birmingham	55.00	55.00	55.00	52.83
Foundry, Chicago	59.00	59.00	59.00	56.50
Basic, del'd Philadelphia	62.77	62.77	62.77	60.27
Basic, Valley furnace	58.50	58.50	58.50	56.00
Malleable, Chicago	59.00	59.00	59.00	56.50
Malleable, Valley	59.00	59.00	59.00	56.50
Ferromanganese, cents per lb.	9.50¢	9.50¢	9.50¢	9.50¢
‡ 74.76 pct Mn base.				
Pig Iron Composite: (per gross ton)				
Pig Iron	\$59.00	\$59.00	\$59.00	\$56.50
Scrap: (per gross ton)				
No. 1 steel, Pittsburgh	\$53.50	\$53.50	\$45.50	\$33.50
No. 1 steel, Phila. area	51.50	51.50	47.50	31.50
No. 1 steel, Chicago	51.50	51.50	44.50	35.50
No. 1 bundles, Detroit	45.50	45.50	40.00	27.50
Low phos., Youngstown	55.00	55.00	49.50	35.50
No. 1 mach'y cast, Pittsburgh	54.50	54.50	52.50	42.50
No. 1 mach'y cast, Philadel'a.	56.50	56.50	52.50	42.00
No. 1 mach'y cast, Chicago	56.50	56.50	54.50	44.00
Steel Scrap Composite: (per gross ton)				
No. 1 heavy melting scrap	\$52.17	\$52.17	\$45.83	\$32.83
Coke, Connellville: (per net ton at oven)				
Furnace coke, prompt	\$14.25	\$14.25	\$14.25	\$14.38
Foundry coke, prompt	16.25	16.25	16.25	16.75
Nonferrous Metals: (cents per pound to large buyers)				
Copper, electrolytic, Conn.	43.00	43.00	43.00	30.00
Copper, Lake, Conn.	43.00	43.00	43.00	30.00
Tin, Straits, New York	110.00	109.50	98.875	85.625
Zinc, East St. Louis	13.00	13.00	13.00	11.50
Lead, St. Louis	15.30	15.30	15.30	14.80
Aluminum, virgin ingot	24.40	24.40	24.40	22.20
Nickel, electrolytic	64.50	64.50	64.50	67.47
Magnesium, ingot	33.25	33.25	33.25	37.75
Antimony, Laredo, Tex.	33.00	33.00	33.00	28.50
† Tentative. ‡ Average. * Revised.				

PIG IRON

Dollars per gross ton, f.o.b., subject to switching charges.

← To identify producers, see Key on P. 109 →

Producing Point	Basic	Fdry.	Mall.	Best.	Low Phos.
Bethlehem B3	60.50	61.00	61.50	62.00	
Birdsboro, Pa. B6	60.50	61.00	61.50	62.00	
Birmingham R3	54.50	55.00*			
Birmingham W9	54.50	55.00*			
Birmingham U4	54.50	55.00*			
Buffalo R3	58.50	59.00	59.50		
Buffalo H1	58.50	59.00	59.50		
Buffalo W6	58.50	59.00	59.50	60.00	
Chester C11	60.50	61.00	61.50		
Chicago J4	58.50	59.00	59.00	59.50	
Cleveland A5	58.50	59.00	59.00	59.50	63.50
Cleveland R3	58.50	59.00	59.00		
Dubuik J4	58.50	59.00	59.00	59.50	
Dubuik J4	58.50	59.00	59.00	59.50	
Everett M6		62.50	63.00		
Fontana K1	64.50	65.00			
Geneva, Utah C7	58.50	59.00			
Granite City C2	60.40	60.90	61.40		
Hubbard Y1			59.00		
Lane Star L3		55.00			
Minneapolis C6	60.50	61.00	61.50		
Monessen P6	58.50				
Neville Is. P4	58.50	59.00	59.00		
N. Tonawanda T1		59.00	59.50		
Pittsburgh U1	58.50			59.50	
Sharpsville S3	58.50	59.00	59.00	59.50	
So. Chicago R3	58.50			59.00	
Steelton B3	60.50	61.00	61.50	62.00	68.50
Swedeland A1	60.50	61.00	61.50	62.00	
Toledo J4	58.50	59.00	59.00	59.50	
Troy, N. Y. R3	60.50	61.00	61.50	62.00	
Youngstown Y1			59.00	59.50	

DIFFERENTIALS: Add, 50¢ per ton for each 0.25 pct silicon or portion thereof over base (1.75 to 2.25 pct except low phos., 1.75 to 2.00 pct) 50¢ per ton for each 0.50 pct manganese or portion thereof over 1 pct. \$2 per ton for 0.5 to 0.75 pct nickel, \$1 for each additional, 0.25 pct nickel. *Add \$1.00 for 0.31-0.49 pct phos.

Silvery Iron: Buffalo, H1, \$68.75; Jackson, J1, G1, \$67.50. Add \$1.00 per ton for each 0.50 pct silicon over base (\$0.01 to 4.50 pct) up to 17 pct. Add 75¢ for each 0.50 pct manganese over 1.0 pct. Bessemer (ferrosilicon) prices are \$1 over comparable silvery iron.

STAINLESS STEEL

Base price cents per lb. f.o.b. mill

Product	301	302	303	304	316	321	348	410	416	430
Ingot, re-rolling	17.75	19.00	—	20.25	31.50	25.00	33.75	15.00	—	15.25
Slabs, billets, re-rolling	22.25	24.75	26.75	26.00	40.25	32.00	43.00	19.50	—	19.75
Forg. discs, die blocks, rings	—	—	—	—	—	—	—	—	—	—
Billets, forging	31.75	32.00	34.75	33.75	51.25	38.25	51.00	25.50	26.00	26.00
Bars, wires, structurals	38.00	38.25	41.00	40.25	60.75	45.25	60.00	30.50	31.00	31.00
Plates	40.00	40.25	42.75	42.00	64.00	49.25	64.75	31.75	33.00	32.25
Sheets	44.25	44.50	—	47.25	68.25	54.25	73.50	38.25	—	38.75
Strip, hot-rolled	32.00	34.50	—	37.25	58.25	44.25	50.75	—	—	—
Strip, cold-rolled	41.00	44.50	—	47.25	68.25	54.25	73.50	36.25	—	36.75

STAINLESS STEEL PRODUCING POINTS:

Sheets: Midland, Pa., C11; Brackenridge, Pa., A3; Butler, Pa., A7; McKeesport, Pa., U1; Washington, Pa., W2, J2; Baltimore, Md., J2; Middletown, O., A7; Massillon, O., R3; Gary, Ind., U1; Bridgeville, Pa., U2; New Castle, Ind., J2; Ft. Wayne, Ind., J4; Philadelphia, Pa., D5.

Strip: Midland, Pa., C11; Cleveland, A5; Carnegie, Pa., S9; McKeesport, Pa., F1; Reading, Pa., C2; Washington, Pa., W2; W. Leeburg, Pa., A3; Bridgeville, Pa., U2; Detroit, Mich., M2; Canton-Massillon, O., R3; Middletown, O., A7; Harrison, N. J., D3; Youngstown, Ohio, Sharon, Pa., S1; Butler, Pa., A7; Wallingford, Conn., U3 (25¢ per lb higher); W1 (25¢ per lb higher); New Bedford, Mass., R6.

Bar: Baltimore, Md., Dugunne, Pa., U1; Munhall, Pa., U1; Reading, Pa., C2; Titusville, Pa., U2; Washington, Pa., J2; McKeesport, Pa., U1; F1; Bridgeville, Pa., U2; Dunkirk, N. Y., A3; Massillon, O., R3; Chicago, Ill., U1; Syracuse, N. Y., C11; Watervliet, N. Y., A3; Waukegan, Ill., Canton, O., T5; Ft. Wayne, Ind., J4; Philadelphia, Pa., D5; Detroit, Mich., R5.

Wire: Waukegan, Ill., Massillon, O., R3; McKeesport, Pa., F1; Ft. Wayne, Ind., J4; Harrison, N. J., D3; Baltimore, Md., Dunkirk, N. Y., A3; Monessen, Pa., F1; Syracuse, N. Y., C11; Bridgeville, Pa., U2.

Structurals: Baltimore, Md., Massillon, O., R3; Chicago, Ill., J4; Watervliet, N. Y., A3; Syracuse, N. Y., C11.

Plates: Brackenridge, Pa., A3; Chicago, Ill., U1; Munhall, Pa., U1; Midland, Pa., C11; New Castle, Ind., J2; Middletown, A7; Washington, Pa., J2; Cleveland, Massillon, R3; Coatesville, Pa., C15; Philadelphia, Pa., D5.

Forged discs, die blocks, rings: Pittsburgh, Pa., C11; Syracuse, N. Y., C11; Ferndale, Mich., A3; Washington, Pa., J2.

Forgings: Midland, Pa., C11; Baltimore, Md., A7; Washington, Pa., J2; McKeesport, Pa., F1; Massillon, Canton, O., R3; Watervliet, N. Y., A3; Pittsburgh, Pa., U1; Syracuse, N. Y., C11; Detroit, Mich., R5.

Prices Hold at High Levels

Buyer opposition fails to shake steelmaking grades in Chicago . . . Blast furnace and foundry scrap advance in the East . . . West Coast prices up . . . Composite holds.

♦ SCRAP prices are holding firmly at peak levels.

Best steelmaking grades are unchanged at major centers. Broad gains were registered in Boston, Cincinnati and on the West Coast.

There are no indications that the market was ready to fall off. In Chicago, a sprinkling of sales at \$1 under the market were more than offset by new advances in other grades.

Pittsburgh reports that record prices have not loosened the flow of scrap from dealers' yards. In Boston, where all prices advanced, scrap is moving rapidly through dealer yards. No one is building up tonnage stocks.

On the West Coast, export competition forced prices up several dollars in Seattle, San Francisco and Los Angeles.

Reports of automotive cutbacks in Detroit are not taken as an indication of any immediate weakening of the scrap market. With strong pressure for steel production and a decline in generation of automotive scrap, Detroit looks for a strong January market.

THE IRON AGE Composite for No. 1 heavy melting steel scrap remains \$52.17.

Pittsburgh . . . The scrap market held firm this week with No. 1 heavy melting at \$54. A large consumer purchased a small tonnage of distress scrap for a reported \$50 per ton. However, spirited broker bidding continues to hold the price at the \$54 level. Even at these figures scrap isn't moving freely from dealers' yards. Latest low phos activity moved the price up another dollar to \$59 and blast furnace grades were also higher as demand spread over a broader front.

Chicago . . . In a storm of buyer opposition, the Chicago scrap market

continued to hold at press time this week. Firm sales at \$1 off in scattered grades were more than offset by fresh advances in others. A flurry of rumors offset the usual pre-Christmas calm, with reports of turnings moving at as much as \$36 on the open market, RR axles capturing prices \$3 over the price and advancing broker buying prices in nearly all grades. Attempts to buy turnings at previously established grades were netting little success on even this, seemingly the weakest grade on the list. Preliminary reports suggest a strong attempt by mills to buy No. 2 grades at a reduced price during the week, and some No. 1 dealer bundles had already moved at \$1 below the top of last week's dealer bundle price spread.

Philadelphia . . . The strong tempo of the market, which finds steel-making grades holding momentarily to earlier levels, is reflected this week in a new upswing in blast furnace and low phos prices. Blast furnace grades are up \$2 over earlier listings, while low phos 5 ft and under shows a new level of \$55, up \$2 over last week's price. Low phos 2 ft and under took a \$3 jump to \$57. Stronger prices are also reported in the cast and railroad specialties markets. Heavy export activity coupled with strong consumer demand in adjacent districts are cited among prime factors in upholding strong domestic price levels at this time.

New York . . . Market here continues strong and active. Pressure for new increases is mounting but higher levels have yet to be confirmed by new orders.

Detroit . . . The present strong market may be even stronger when the January lists come out in about 10 days. Cutbacks in auto production are expected to limit the amount of scrap produced next month. The shortage, combined with a strong demand, will be the cause of higher

prices. Estimates are that the January lists will be anywhere from 5 to 10 pct smaller than December.

Cleveland . . . A new scramble for scrap early next year is in the making with autostamping plants heavily concentrated in Cleveland planning a cutback in production but continuing pressure on new steel orders for inventory building. Dumping of remaining dealer scrap held for tax reasons may also loosen market and test actual strength.

Birmingham . . . The steel scrap market in this district is unusually active for this time of year, with prices continuing to advance on many items and remaining steady on others. Some consumers are paying above the market for special orders. No. 1 heavy melting steel advanced a dollar this week, but No. 2 was unchanged. An Atlanta mill was said to be paying \$47 for No. 1, but the principal buyer in Alabama was out of the market.

St. Louis . . . Prime scrap items continued their upward climb. A MOPAC list of 189 carloads, of which 100 carloads were No. 1 RR hvy melting, brought \$3 per ton advance and other railroad items were from \$1 to \$3 higher. Receipts were equal to the melt.

Cincinnati . . . Dealers starting to take some orders for January delivery and brokers fairly well covered for late deliveries this month at about \$1 higher and pulling in horns. Some scrap coming up river from Louisville and Memphis but little going on to Pittsburgh.

Buffalo . . . Brisk activity and firm prices mark the scrap scene here. No. 1 machinery cast advanced to \$48 for the only price change.

Boston . . . Prices of all grades moved up at least \$1 in a hot Boston market. Export is strong. Eastern Pennsylvania mills are active. No one is holding any tonnage of scrap.

West Coast . . . Renewed export activity shoved scrap prices up several dollars in Seattle, San Francisco, and Los Angeles. Mills hope the new prices will give them enough scrap to keep operating at the 100 pct rate. It doesn't look good for any inventory build-ups at the mills. Export pressure continues strong.

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December 22, 1955

Scrap Prices (Effective Dec. 26, 1955)

Pittsburgh

No. 1 hvy. melting	\$53.00 to \$54.00
No. 2 hvy. melting	47.00 to 48.00
No. 1 bundles	53.00 to 54.00
No. 2 bundles	43.00 to 44.00
Machine shop turn	32.00 to 33.00
Mixed bor. and ms. turn	32.00 to 33.00
Shoveling turnings	26.00 to 37.00
Cast iron borings	36.00 to 37.00
Low phos. punch'g's plate	54.00 to 59.00
Heavy turnings	44.00 to 45.00
No. 1 RR. hvy. melting	55.00 to 56.00
Scrap rails, random lgth.	61.00 to 62.00
Rails 2 ft and under	67.00 to 68.00
RR. steel wheels	59.00 to 60.00
RR. spring steel	59.00 to 60.00
RR. couplers and knuckles	59.00 to 60.00
No. 1 machinery cast.	54.00 to 55.00
Cupola cast.	46.00 to 47.00
Heavy breakable cast.	44.00 to 45.00

Chicago

No. 1 hvy. melting	\$51.00 to \$52.00
No. 2 hvy. melting	43.00 to 44.00
No. 1 factory bundles	55.00 to 56.00
No. 1 dealers' bundles	51.00 to 52.00
No. 2 dealers' bundles	41.00 to 42.00
Machine shop turn.	32.00 to 33.00
Mixed bor. and turn.	34.00 to 35.00
Shoveling turnings	34.00 to 35.00
Cast iron borings	34.00 to 35.00
Low phos. forge crops	60.00 to 61.00
Low phos. punch'g's plate	57.00 to 58.00
Low phos. 3 ft and under	56.00 to 57.00
No. 1 RR. hvy. melting	55.00 to 56.00
Scrap rails, random lgth.	65.00 to 66.00
Rolling rails	72.00 to 74.00
Rails 2 ft and under	70.00 to 71.00
Locomotive tires, cut	58.00 to 59.00
Cut bolsters & side frames	59.00 to 60.00
Angles and splice bars	66.00 to 67.00
RR. steel car axles	67.00 to 68.00
RR. couplers and knuckles	59.00 to 60.00
No. 1 machinery cast.	56.00 to 57.00
Cupola cast.	52.00 to 53.00
Heavy breakable cast.	44.00 to 45.00
Cast iron brake shoes	41.00 to 42.00
Cast iron car wheels	50.00 to 51.00
Malleable	62.00 to 64.00
Stove plate	42.00 to 44.00

Philadelphia Area

No. 1 hvy. melting	\$51.00 to \$52.00
No. 2 hvy. melting	47.00 to 48.00
No. 1 bundles	51.00 to 52.00
No. 2 bundles	43.00 to 44.00
Machine shop turn.	36.00 to 37.00
Mixed bor. short turn.	5.00 to 37.00
Cast iron borings	36.00 to 37.00
Shoveling turnings	38.00 to 39.00
Clean cast chem. borings	41.00 to 42.00
Low phos. 5 ft and under	54.00 to 55.00
Low phos. 2 ft and under	56.00 to 57.00
Low phos. punch'g's	56.00 to 57.00
Elec. furnace bundles	52.00 to 53.00
Heavy turnings	47.00 to 48.00
RR. steel wheels	55.00 to 56.00
RR. spring steel	55.00 to 56.00
Rails 18 in. and under	62.00 to 64.00
Cupola cast.	50.00 to 51.00
Heavy breakable cast.	52.00 to 53.00
Cast iron car wheels	57.00 to 58.00
Malleable	64.00 to 65.00
Unstripped motor blocks	39.00 to 40.00
No. 1 machinery cast.	56.00 to 57.00

Cleveland

No. 1 hvy. melting	\$51.00 to \$52.00
No. 2 hvy. melting	41.50 to 42.50
No. 1 bundles	51.00 to 52.00
No. 2 bundles	40.00 to 42.00
No. 1 busheling	51.00 to 52.00
Machine shop turn.	28.00 to 27.00
Mixed bor. and turn.	30.00 to 31.00
Shoveling turnings	30.00 to 31.00
Cast iron borings	30.00 to 31.00
Cut struct'l & plates, 2 ft & under	54.00 to 55.00
Drop forge flashings	49.50 to 50.50
Low phos. punch'g's plate	52.00 to 53.00
Foundry steel, 2 ft & under	54.00 to 55.00
No. 1 RR. heavy melting	55.00 to 56.00
Rails 2 ft and under	70.00 to 71.00
Rails 18 in. and under	71.00 to 72.00
Railroad grate bars	40.00 to 41.00
Steel axle turnings	34.00 to 35.00
Railroad cast.	55.00 to 56.00
No. 1 machinery cast.	54.00 to 55.00
Stove plate	50.00 to 51.00
Malleable	57.00 to 58.00

Iron and Steel Scrap

Going prices of iron and steel scrap as obtained in the trade by THE IRON AGE based on representative tonnages. All prices are per gross ton delivered to consumer unless otherwise noted.

Youngstown

No. 1 hvy. melting	\$53.50 to \$54.50
No. 2 hvy. melting	43.00 to 45.00
No. 1 bundles	53.50 to 54.50
No. 2 bundles	42.50 to 44.50
Machine shop turn.	29.00 to 30.00
Shoveling turnings	33.00 to 34.00
Cast iron borings	33.00 to 34.00
Low phos. plate	54.50 to 55.50

Buffalo

No. 1 hvy. melting	\$43.00 to \$44.00
No. 2 hvy. melting	39.00 to 40.00
No. 1 busheling	43.00 to 44.00
No. 2 bundles	43.00 to 44.00
No. 2 bundles	36.00 to 37.00
Machine shop turn.	27.00 to 28.00
Mixed bor. and turn.	28.00 to 29.00
Shoveling turnings	29.00 to 30.00
Cast iron borings	29.00 to 30.00
Low phos. plate	46.00 to 47.00
Scrap rails, random lgth.	47.00 to 48.00
Rails 2 ft and under	54.00 to 55.00
RR. steel wheels	48.00 to 49.00
RR. springs steel	48.00 to 49.00
RR. couplers and knuckles	48.00 to 49.00
No. 1 machinery cast.	47.00 to 48.00
No. 1 cupola cast.	42.00 to 43.00

Detroit

Brokers buying prices per gross ton, on cars:	
No. 1 hvy. melting	\$45.00 to \$46.00
No. 2 hvy. melting	34.00 to 35.00
No. 1 bundles, openhearth	45.00 to 46.00
No. 2 bundles	31.00 to 32.00
New busheling	45.00 to 46.00
Drop forge flashings	44.50 to 45.50
Machine shop turn.	21.00 to 22.00
Mixed bor. and turn.	24.00 to 25.00
Shoveling turnings	24.00 to 25.00
Cast iron borings	24.00 to 25.00
Low phos. punch'g's plate	45.00 to 46.00
No. 1 cupola cast.	42.00 to 43.00
Heavy breakable cast.	36.00 to 37.00
Stove plate	37.00 to 38.00
Automotive cast.	45.00 to 46.00

St. Louis

No. 1 hvy. melting	\$41.50 to \$42.50
No. 2 hvy. melting	39.00 to 40.00
No. 1 bundles	44.00 to 45.00
No. 2 bundles	35.00 to 36.00
Machine shop turn.	29.00 to 30.00
Cast iron borings	31.00 to 32.00
Shoveling turnings	31.00 to 32.00
No. 1 RR. hvy. melting	55.00 to 56.00
Rails, random lengths	60.50 to 61.50
Rails, 18 in. and under	66.00 to 67.00
Locomotive tires uncut	59.00 to 60.00
Angles and splice bars	59.00 to 60.00
Std. steel car axles	61.00 to 62.00
RR. specialties	60.00 to 61.00
Cupola cast.	53.00 to 54.00
Heavy breakable cast.	40.00 to 42.00
Cast iron brake shoes	42.00 to 43.00
Stove plate	41.00 to 42.00
Cast iron car wheels	50.00 to 51.00
Rolling rails	70.00 to 71.00
Malleable	50.00 to 51.00
Unstripped motor blocks	41.00 to 42.00

Boston

Brokers buying prices per gross ton, on cars:	
No. 1 hvy. melting	\$40.00 to \$41.00
No. 2 hvy. melting	35.00 to 36.00
No. 1 bundles	40.00 to 41.00
No. 2 bundles	33.00 to 34.00
No. 1 busheling	40.00 to 41.00
Elec. furnace, 3 ft & under	44.00
Machine shop turn.	24.00 to 25.00
Mixed bor. and short turn	26.00 to 27.00
Shoveling turnings	27.00 to 28.00
Clean cast chem. borings	26.00 to 27.00
No. 1 machinery cast.	45.00
Mixed cupola cast.	39.00 to 40.00
Heavy breakable cast.	39.00 to 40.00
Stove plate	38.00 to 39.00
Unstripped motor blocks	22.00 to 23.00

New York

Brokers buying prices per gross ton, on cars:	
No. 1 hvy. melting	\$46.00 to \$47.00
No. 2 hvy. melting	42.00 to 43.00
No. 2 bundles	37.00 to 38.00
Machine shop turn.	25.00 to 26.00
Mixed bor. and turn.	26.00 to 27.00
Shoveling turnings	27.00 to 28.00
Clean cast chem. borings	31.00 to 32.00
No. 1 machinery cast.	46.00 to 47.00
Mixed yard cast.	44.00 to 45.00
Charging box cast.	45.00 to 46.00
Heavy breakable cast.	45.00 to 46.00
Unstripped motor blocks	29.00 to 30.00

Birmingham

No. 1 hvy. melting	\$43.00 to \$44.00
No. 2 hvy. melting	38.00 to 39.00
No. 1 bundles	43.00 to 44.00
No. 2 bundles	30.00 to 31.00
No. 1 busheling	42.00 to 43.00
Machine shop turn.	29.00 to 30.00
Shoveling turnings	30.00 to 31.00
Cast iron borings	18.00 to 19.00
Electric furnace bundles	47.00 to 48.00
Bar crops and plate	51.00 to 52.00
Structural and plate, 2 ft.	50.00 to 51.00
No. 1 RR. hvy. melting	46.00 to 47.00
Scrap rails, random lgth.	57.00 to 58.00
Rails, 18 in. and under	63.00 to 64.00
Angles & splice bars	60.00 to 61.00
Rolling rails	64.00 to 65.00
No. 1 cupola cast.	47.50 to 48.50
Stove plate	44.50 to 45.50
Charging box cast.	30.00 to 31.00
Cast iron car wheels	38.00 to 39.00
Unstripped motor blocks	39.00 to 40.00
Mashed tin cans	15.00 to 16.00

Cincinnati

Brokers buying prices per gross ton, on cars:	
No. 1 hvy. melting	\$46.00 to \$47.00
No. 2 hvy. melting	40.00 to 41.00
No. 1 bundles	46.00 to 47.00
No. 2 bundles	38.00 to 39.00
Machine shop turn.	31.00 to 32.00
Mixed bor. and turn.	29.00 to 30.00
Shoveling turnings	34.00 to 35.00
Cast iron borings	30.00 to 31.00
Low phos. 18 in. & under	55.00 to 56.00
Rails, random lengths	61.00 to 62.00
Rails, 18 in. and under	68.00 to 69.00
No. 1 cupola cast.	46.00 to 47.00
Hvy. breakable cast.	44.00 to 45.00
Drop broken cast.	54.50 to 55.50

San Francisco

No. 1 hvy. melting	\$42.00
No. 2 hvy. melting	38.00
No. 1 bundles	41.00
No. 2 bundles	36.00
No. 3 bundles	29.00
Machine shop turn.	20.00
Cast iron borings	20.00
No. 1 RR. hvy. melting	42.00
No. 1 cupola cast.	50.00

Los Angeles

No. 1 hvy. melting	\$42.00
No. 2 hvy. melting	38.00
No. 1 bundles	41.00
No. 2 bundles	33.00
No. 3 bundles	29.00
Machine shop turn.	20.00
Shoveling turnings	23.00
Cast iron borings	20.00
Elec. furn. 1 ft and under	42.00
No. 1 RR. hvy. melting	42.00
No. 1 cupola cast.	48.00

Seattle

No. 1 hvy. melting	\$44.00
No. 2 hvy. melting	40.00
No. 2 bundles	34.00
No. 3 bundles	30.00
No. 1 cupola cast.	40.00
Mixed yard cast.	40.00

Hamilton, Ont.

No. 1 hvy. melting	\$43.50
No. 2 hvy. melting	39.50
No. 1 bundles	43.50
No. 2 bundles	36.00
Mixed steel scrap	32.50
Bushelings	33.50
Bush., new fact. prep'd	41.50
Bush., new fact. unprep'd	37.50
Machine shop turn.	16.00
Short steel turn.	25.50
Mixed bor. and turn.	\$16.00 to 17.00
Rails, rerolling	47.50
Cast scrap	42.00 to 45.00

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Chile Copper Strike

Workers dissatisfied with government action on new labor law . . . Chilean president calls strike illegal and threatens action . . . World markets unaffected.

♦ BY STRIKING "against the government" the Chilean copper miners have touched off a tinder box situation and very well might wind up getting burnt themselves.

The new Chilean copper law calls for a special committee to set up the rules by which the American subsidiary copper producers will deal with the Confederation of Copper Workers. The group consisted of three government men, three from the producers, and three union representatives. The Chilean government is under pressure from the Anaconda subsidiary concerning new capital investment. And the Government is trying to promote a 46¢ copper price in the U. S. It backed a middle-of-the-road policy which in effect favors the producers. The Chilean miners, finding themselves a minority, called a one-day strike in November as an attempt to influence the government.

The government reacted by setting up the machinery to break any future strikes. Several areas which include copper facilities were declared emergency zones and military commanders were appointed. Chilean president Ibanez declared that a strike would be illegal and "the government would take energetic measures against such actions."

The workers, whose standards of living are higher than the average

Chilean worker, are demanding among other things a bonus of six months' wages and many fringe benefits.

Ibanez has cabinet and military backing and is able to influence parliamentary action. He will attempt to force the miners back to work by threats. If this doesn't work, he will use one of two time-tested methods—mass arrests and force, or a new selective service program which could draft striking copper workers into the army. The striking miners have already cost Ibanez' government the revenue from over 5000 short tons of copper ore and his higher U. S. price bargaining position. He does not feel kindly nor will he act kindly toward the workers. The feeling in the major copper consuming countries seems to be that Ibanez is strong enough to handle the situation. The London market is holding steady. The American situation is quiet with producers saying little and custom smelters holding firm at their current price of 50¢.

ALUMINUM . . . A shortage of water in the reservoirs of Quebec, Canada which supply hydro-electric power to Aluminum Company of Canada will result in a 10 pct reduction of Canadian output in 1956. This means a loss of about 65,000 tons of primary aluminum from the source which many held to be the key to an

eventual easing of the currently tight aluminum market.

In this country the outlook is much brighter. According to the Aluminum Association, primary aluminum production in 1955 will exceed 3 billion lbs for the first time. This year's output is expected to top 1954 by about 7 pct. I. W. Wilson, president of Aluminum Company of America, expects 1956 to be an even bigger year for his company despite the fact that 1955 is an all-time record. With Kaiser serving notice that it expects to pass Reynolds and become the nation's number two aluminum producer, it is entirely possible that the 1956 market might loosen up considerably despite the unfortunate Canadian position.

Frederick A. Merliss will take a leave of absence from his position as general superintendent of United Smelting & Aluminum Co., Inc., to accept a position as deputy director of the Aluminum and Magnesium Div., Business and Defense Services Administration. Mr. Merliss is to serve with BDSA for at least six months.

MAGNESIUM . . . While the 1151 short tons of magnesium castings shipped during October 1955 dropped 7 pct below the 1239 tons for September, it was still above the 1026 tons shipped during October 1954. Sand castings which account for a major part of the total were off 2 pct from the previous month and 3 pct from a year ago. However, die castings, 282 short tons, showed an increase over both September 1955 and October 1954 to make up part of the difference.

SCRAP . . . Joseph Roth, president of the Metal Dealers Div., of the National Association of Waste Material Dealers, Inc., indicated that 1955 was a record year for nonferrous dealers. Mr. Roth posed two questions, the answers to which would hold the key to the future nonferrous scrap market:

1. Will automobile producing companies maintain the 8 million unit annual car production schedule?
2. Will the U. S. decide to maintain or increase defense spending?

If the answer to the first question is affirmative Mr. Roth expects copper, aluminum, zinc, and lead to stay in tight supply. A negative reply will mean a possible oversupply of these metals. Trouble spots in the Far and Middle East indicate to Mr. Roth that defense spending will stay solid.

Daily Nonferrous Metal Prices

(Cents per lb except as noted)

	Dec. 14	Dec. 15	Dec. 16	Dec. 17	Dec. 19	Dec. 20
Copper, electro, Conn.	43.00	43.00	43.00	43.00	43.00
Copper, Lake, delivered	43.00	43.00	43.00	43.00	43.00
Tin, Straits, New York	110.00	109.75	110.00	110.00	110.25	110.00*
Zinc, East St. Louis	13.00	13.00	13.00	13.00	13.00	13.00
Lead, St. Louis	15.30	15.30	15.30	15.30	15.30	15.30

Note: Quotations are going prices

*Tentative

Nonferrous Prices (Effective Dec. 20, 1955)

MILL PRODUCTS

(Cents per lb, unless otherwise noted)

Aluminum
(Base 30,000 lb, f.o.b. ship. pt., frt. allowed)

Flat Sheet (Mill Finish) and Plate
(“F” temper except 6061-0)

Alloy	.032	.081	.136-	.250-
			.249	3.
1100, 3003....	40.8	38.7	37.5	36.5
5052.....	48.3	43.4	41.7	39.9
6061-0.....	45.4	41.2	39.4	39.3

Extruded Solid Shapes

Factor	6063 T-5	6062 T-6
6-8.....	41.6-43.3	56.6-60.2
12-14.....	42.3-43.7	57.5-61.8
24-26.....	45.3-45.7	67.7-72.1
30-38.....	53.6-54.2	90.5-94.3

Screw Machine Stock—2011-T-3

Size*	3/4	5/8	1/2	3/8
Price	54.5	53.4	52.1	50.1

Roofing Sheet, Corrugated

(Per sheet, 26" wide, base, 16,000 lb)

Length* →	72	96	120	144
.019 gage....	\$1.295	\$1.727	\$2.160	\$2.590
.024 gage....	1.615	2.102	2.692	3.232

Magnesium

(F.o.b. mill, freight allowed)

Sheet & Plate: FS1-O 1/4 in., 61¢; 3/16 in., 62¢; 1/8 in., 61¢; 0.064 in., 75¢; 0.032 in., 90¢. Specification grade higher. Base, 30,000 lb.

Extruded Round Rod: FS, diam 1/4 to 3/16 in., 82.5¢; 1/2 to 3/8 in., 65¢; 1 1/4 to 1.749 in., 60.5¢; 2 1/2 to 5 in., 57¢. Other alloys higher. Base, in weight per ft of shape: Up to 1/2 lb, 10,000 lb; 1/2 to 1.50 lb, 20,000 lb; 1.50 lb and heavier, 30,000 lb.

Extruded Solid Shapes: Rectangles: FS. In weight per ft for perimeters less than size indicated: 0.10 to 0.11 lb, 3.5 in., 70.7¢; 0.22 to 0.25 lb, 5.9 in., 66.9¢; 0.50 to 0.59 lb, 8.6 in., 63¢; 1.5 to 2.59 lb, 19.5 in., 60.8¢; 4 to 6 lb, 28 in., 57.7¢. Other alloys higher. Base, in weight per ft of shape: Up to 1/2 lb, 10,000 lb; 1/2 to 1.50 lb, 20,000 lb; 1.50 lb and heavier, 30,000 lb.

Extruded Round Tubing: FS, 0.049 to 0.057 in. wall thickness: OD 1/4 to 5/16 in., \$1.625; 5/16 to 3/8 in., \$1.475; 1/2 to 3/4 in., \$1.195; 1 to 2 in., 92.5¢; 0.165 to 0.219 in. wall: OD 3/4 to 1 1/2 in., 75.5¢; 1 to 2 in., 71.5¢; 3 to 4 in., 70.5¢. Other alloys higher. Base OD: Up to 1 1/2 in., 10,000 lb; 1 1/2 to 3 in., 20,000 lb; over 3 in., 30,000 lb.

Copper, Brass, Bronze

(Freight included on 500 lb)

	Sheet	Rods	Extruded Shapes
Copper.....	63.13	59.11	61.45
Copper, h-r.....	58.76	59.11	61.45
Copper, drawn.....	56.55	56.49	58.03
Low brass.....	52.27	52.21	54.94
Yellow brass.....	58.09	58.03	58.03
Red brass.....	52.83	49.94	48.40
Naval brass.....	60.18	60.12	48.42
Lead brass.....	59.39	53.35	54.94
Comm. bronze.....	81.00	81.50	81.50
Muntz metal.....	53.74	49.55	50.80
Ni silver, 10 pct.....	66.00	68.33	70.68
Beryllium copper, CR, 1.9% Be, Base			
2000 lb, f.o.b.			
Strip.....			\$1.84
Rod, bar, wire.....			1.81

Nickel, Monel, Inconel

(Base prices, f.o.b. mill)

	"A" Nickel	Monel	Inconel
Sheet, CR.....	102	88	99
Strip, CR.....	103	92	135
Rod, Bar, HR.....	87	74	93
Angles, HR.....	87	74	93
Plate, HR.....	97	87	95
Seamless Tube.....	123	110	153
Shot, Blocks.....	71

Titanium

(10,000 lb base, f.o.b. mill)

Sheet and strip, commercially pure, \$18.10-\$12.60; alloy \$18.25-\$16.75; Plate, HR, commercially pure, \$10.50-\$11.00; alloy, \$11.50-\$12.00. Wire, rolled and/or drawn, commercially pure, \$9.50-\$11.50; alloy, \$11.50; Bar, HR or forged, commercially pure, \$7.90-\$8.15; alloy, \$7.90-\$8.10.

PRIMARY METAL

(Cents per lb, unless otherwise noted)

Aluminum ingot, 99+%, 10,000 lb, freight allowed.....	24.40
Aluminum pig.....	22.50
Antimony, American, Laredo, Tex.....	33.50
Beryllium copper, per lb cont'd Be.....	\$43.00
Beryllium aluminum 5% Be, Dollars per lb contained Be.....	\$72.75
Bismuth, ton lots.....	\$2.25
Cadmium, del'd.....	\$1.70
Cobalt, 97-99% (per lb).....	\$2.60 to \$2.67
Copper, electro, Conn. Valley.....	43.00
Copper, Lake, delivered.....	43.00
Gold, U. S. Treas., per troy oz.....	\$35.00
Indium, 99.9%, dollars per troy oz.....	\$2.25
Iridium, dollars per troy oz.....	\$100 to \$120
Lead, St. Louis.....	15.30
Lead, New York.....	15.50
Magnesium, 99.8+%, f.o.b. Freeport, Tex., 10,000 lb, pig.....	32.50
Ingot.....	32.25
Magnesium, stick, 100 to 500 lb.....	53.00
Mercury, dollars per 74-lb flask, f.o.b. New York.....	\$280 to \$285
Nickel electro.....	64.50
Nickel oxide sinter at Copper Cliff, Ont., contained nickel.....	60.75
Palladium, dollars per troy oz.....	\$22.20 to \$24
Platinum, dollars per troy oz.....	\$97 to \$99
Silver, New York, cents per troy oz.....	90.75
Tin, New York.....	119.00*
Titanium sponge, grade A-1.....	32.45
Zinc, East St. Louis.....	13.00
Zinc, New York.....	12.50
Zirconium, sponge.....	\$10.00

* Tentative

REMELTED METALS

Brass Ingot

(Cents per lb delivered, carloads)

85-5-5-5 ingot.....	42.00
No. 115.....	41.25
No. 120.....	40.50
No. 123.....	40.50
80-10-10 ingot.....	46.75
No. 305.....	44.00
No. 315.....	58.25
89-10-2 ingot.....	54.75
No. 210.....	48.75
No. 215.....	32.25
No. 245.....	37.75
Yellow ingot.....	32.25
No. 405.....	37.75
Manganese bronze.....	37.75
No. 421.....	37.75

Aluminum Ingot

(Cents per lb del'd 30,000 lb and over)

95-5 aluminum-silicon alloys.....	32.75-34.00
0.30 copper max.....	32.50-33.75
0.60 copper max.....	31.50-32.50
Piston alloys (No. 122 type).....	31.00-31.50
No. 12 alum. (No. 2 grade).....	31.00-31.50
108 alloy.....	31.00-31.50
195 alloy.....	32.50-34.00
13 alloy (0.60 copper max.).....	32.50-33.75
AXB-679.....	31.00-31.50

Steel deoxidizing aluminum, notch bar granulated or shot

Grade 1—95-97 1/2%.....	31.25-32.25
Grade 2—92-95%.....	30.25-31.25
Grade 3—90-92%.....	29.50-30.50
Grade 4—85-90%.....	29.00-29.50

SCRAP METALS

Brass Mill Scrap

(Cents per pound, add 1¢ per lb for shipments of 20,000 lb and over)

	Heavy	Turnings
Copper.....	39	38 1/2
Yellow brass.....	28 1/2	26 1/2
Red brass.....	34 1/2	33 1/2
Comm. bronze.....	26 1/2	26
Mang. bronze.....	27	26 1/2
Yellow brass rod ends.....	28 1/2	28 1/2

Custom Smelters Scrap

(Cents per pound carload lots, delivered to refinery)

No. 1 copper wire.....	43 1/2
No. 2 copper wire.....	42
Light copper.....	39 1/2
* Refinery brass.....	39
* Dry copper content.....	39

Ingot Makers Scrap

(Cents per pound carload lots, delivered to refinery)

No. 1 copper wire.....	43 1/2
No. 2 copper wire.....	41
Light copper.....	39
No. 1 composition.....	35 1/2
No. 1 comp. turnings.....	34 1/2
Hvy. yellow brass solids.....	24 1/2
Brass pipe.....	29
Radiators.....	29

Aluminum

Mixed old cast.....	21 1/2—22
Mixed new clips.....	22—23
Mixed turnings, dry.....	20 1/2—22

Dealers' Scrap

(Dealers' buying price, f.o.b. New York in cents per pound)

Copper and Brass

No. 1 heavy copper and wire.....	41—41 1/2
No. 2 heavy copper and wire.....	38 1/2—39
Light copper.....	36—36 1/2
New type shell cuttings.....	36—36 1/2
Auto radiators (unsweated).....	24—24 1/2
No. 1 composition.....	31 1/2—32
No. 1 composition turnings.....	29 1/2—30
Unlined red car boxes.....	24 1/2—25
Cocks and faucets.....	24 1/2—25
Clean heavy yellow brass.....	21—21 1/2
Brass pipe.....	25 1/2—26
New soft brass clippings.....	25 1/2—26
No. 1 brass rod turnings.....	23 1/2—24

Aluminum

Alum. pistons and struts.....	17—17 1/2
Aluminum crankcases.....	16 1/2—17
1100 (28) aluminum clippings.....	20—20 1/2
Old sheet and utensils.....	16 1/2—17
Borings and turnings.....	11 1/2—12
Industrial castings.....	16 1/2—17 1/2
2024 (24s) clippings.....	18 1/2—19

Zinc

New zinc clippings.....	8—8 1/2
Old zinc.....	5 1/2—6
Zinc routings.....	4
Old die cast scrap.....	3 1/2

Nickel and Monel

Pure nickel clippings.....	\$1.25
Clean nickel turnings.....	\$1.00
Nickel anodes.....	\$1.25
Nickel rod ends.....	\$1.25
New Monel clippings.....	64 1/2
Clean Monel turnings.....	44
Old sheet Monel.....	86
Nickel silver clippings, mixed.....	22
Nickel silver turnings, mixed.....	19

Lead

Soft scrap lead.....	13—13 1/2
Battery plates (dry).....	8 1/2—9 1/2
Batteries, acid free.....	4 1/2

Magnesium

Segregated solids.....	15 1/2—19
Castings.....	17 1/2—18

Miscellaneous

Block tin.....	81—82
No. 1 pewter.....	64—65
Auto babbit.....	43—44
Mixed common babbit.....	15
Solder joints.....	20—20 1/2
Siphon tops.....	47
Small foundry type.....	16 1/2
Monotype.....	16
Lino. and stereotype.....	14—14 1/2
Electrotype.....	12—12 1/2
Hand picked type shells.....	10 1/2—11
Lino. and stereo. dross.....	8
Electro. dross.....	8

IRON AGE

STEEL
PRICES(Effective
Dec. 30, 1933)

Italics identify producers listed in key at end of table. Base prices, f.o.b. mill, in cents per lb., unless otherwise noted. Extras apply.

	BILLETS, BLOOMS, SLABS			PIL- ING	SHAPES STRUCTURALS			STRIP					
	Carbon Revolving Net Ton	Carbon Forging Net Ton	Alloy Net Ton		Carbon	Hi Str. Low Alloy	Carbon Wide- Flange	Hot- rolled	Cold- rolled	Hi Str. H.R. Low Alloy	Hi Str. C.R. Low Alloy	Alloy Hot- rolled	Alloy Cold- rolled
EAST	Bethlehem, Pa.		\$96.00 B3		4.65 B3	6.80 B1	4.65 B1						
	Buffalo, N. Y.	\$66.50 B3	\$84.50 R3, B3	\$96.00 R3, B3	5.45 B3	4.65 B3	6.80 B1	4.65 B3	4.325 R3, B3 6.25 B3 6.25 R7, S10,	6.425 B3	9.10 B3		
	Claymont, Del.												
	Harrison, N. J.												13.45 C11
	Conschohocken, Pa.							4.375 A2	6.30 A2	6.425 A2			
	New Bedford, Mass.								6.70 R6				
	Johnstown, Pa.	\$68.50 B3	\$84.50 B3	\$96.00 B3		4.65 B3	6.80 B3						
	Boonton, Mass.								6.80 T8				13.80 T8
	New Haven, Conn.								6.70 D1 A5				
	Phoenixville, Pa.				5.15 P2		5.15 P2						
	Sparrows Pt., Md.							4.325 B3	6.25 B3	6.425 B3	9.10 B3		
	Bridgeport, Wallingford, Conn.	\$73.50 N8	\$89.50 N8					4.625 N8	6.70 W1			7.50 N8	
MIDDLE WEST	Pawtucket, R. I. Worcester, Mass.								6.80 N7 A5				13.80 N7 A5
	Alton, Ill.							4.50 L1					
	Ashland, Ky.							4.325 A7					
	Canton-Massillon, Dover, Ohio		\$86.50 R3	\$96.00 R3									13.45 G4
	Chicago, Ill.	\$68.50 U1	\$84.50 R3, U1, W8	\$96.00 R3, U1, W8	5.45 U1	4.60 U1, W8	6.75 U1, Y1	4.60 U1	4.55 A1 4.325 N4, W8	6.35 A1, T8		7.20 W8	13.45 T8
	Cleveland, Ohio								6.25 A3, J3		9.30 A3		13.45 A3
	Detroit, Mich.			\$96.00 R5				4.625 G3, M2	6.35 D1, D2, G3, M2, P11	6.525 G3	9.20 D1, G3		
	Duluth, Minn.												
	Gary, Ind. Harbor, Indiana	\$68.50 U1	\$84.50 U1	\$96.00 U1, Y1	5.45 J3	4.60 U1, J3	6.75 U1, J3	4.325 J3, U1, Y1	6.35 J3 6.25 Y1	6.425 J3, U1, Y1	9.30 Y1	7.20 Y1, U1	
	Sterling, Ill.							4.625 N4					
	Indianapolis, Ind.								6.40 C3				
	Newport, Ky.											7.20 N5	
WEST	Middletown, Ohio								6.45 A7				
	Niles, Warren, Ohio Sharon, Pa.	\$68.50 C10	\$84.50 C10	\$96.00 C10				4.325 S1, R3	6.35 S1, R3, T4	6.425 S1, R3	9.10 S1, R3	7.20 S1	13.45 S1
	Pittsburgh, Pa. Midland, Pa. Butler, Pa.	\$68.50 U1, J3	\$84.50 J3, U1, C11	\$96.00 U1, C11	5.45 U1	4.60 U1, J3	6.75 U1, J3	4.60 U1	4.325 P6	6.25 S7, B4		7.20 S9	13.45 S9
	Portsmouth, Ohio							4.325 P7	6.25 P7				
	Wairton, Wheeling, Follensbee, W. Va.					4.60 W3		4.325 W3	6.25 F3, W3	6.425 W3	9.10 W3		
	Youngstown, Ohio		\$84.50 C10	\$96.00 Y1, C10		4.60 Y1	6.75 Y1	4.325 U1, Y1	6.25 Y1, C3	6.425 U1, Y1	9.30 Y1	7.20 U1, Y1	13.45 C3
	Fontana, Cal.	\$76.00 K1	\$92.00 K1	\$115.00 K1		5.25 K1	7.40 K1	5.40 K1	5.675 K1	8.00 K1	7.525 K1	8.85 K1	
	Genova, Utah		\$84.50 C7			4.60 C7	6.75 C7						
	Kansas City, Mo.					4.70 S2	6.85 S2			6.675 S2		7.45 S2	
	Los Angeles, Torrance, Cal.		\$94.00 B2	\$116.00 B2		5.30 C7, B2	7.45 B2	5.675 C7, B2	8.30 C1			8.40 B2	
	Minneapolis, Colo.					4.98 C6		5.425 C6					
	Portland, Ore.					5.35 O2							
SOUTH	San Francisco, Niles, Pittsburg, Cal.		\$94.00 B2			5.25 B2, P9	7.40 B2	5.675 B2, C7					
	Seattle, Wash.		\$96.00 B2			5.35 B2	7.50 B2	5.325 B2					
	Atlanta, Ga.							4.525 A8					
	Fairfield, Ala. City, Birmingham, Ala.	\$68.50 T2	\$84.50 T2			5.10 C16, 4.60 R3, T2	6.75 T2	4.325 R3, T2 4.625 C16		6.425 T2			
	Houston, Lone Star, Tex.	\$74.50 L3	\$89.50 S2	\$101.00 S2		4.70 S2	6.85 S2			6.675 S2		7.45 S2	

IRON AGE		/Italics identify producers listed in key at end of table. Base prices, f.o.b. mill, in cents per lb., unless otherwise noted. Extras apply.												
STEEL PRICES (Effective Dec. 20, 1955)		SHEETS								WIRE ROD	TINPLATE†		BLACK PLATE	
		Hot-rolled 18 ga. & heavy.	Cold-rolled	Galvanized 18 ga.	Enamel- ing 12 ga.	Long Tens 10 ga.	Hi Str. Low Alloy H.R.	Hi Str. Low Alloy C.R.	Hi Str. Low Alloy Galv.	Hot-rolled 19 ga.		Cokes* 1.25-lb. base box	Electro* 0.25-lb. base box	Holloware Enameling 29 ga.
EAST	Bethlehem, Pa.													
	Buffalo, N. Y.	4.325 B3	5.325 B3				6.375 B3	7.875 B3			W6	† Special coated mfg. terms deduct 5¢ from 1.25-lb. cokes base box price. Can-making quality blackplate 55 to 128 lb. deduct \$2.20 from 1.25-lb. cokes base box. * COKE: 1.50-lb. add 25¢. ELECTRO: 0.50-lb. add 25¢; 0.75-lb. add 65¢; 1.00-lb. add \$1.00. Differential 1.00 lb./0.25 lb. add 65¢.		
	Claymont, Del.													
	Coatesville, Pa.													
	Conschohocken, Pa.	4.375 A2	5.375 A2				6.425 A2							
	Harrisburg, Pa.													
	Hartford, Conn.													
	Johannston, Pa.									5.025 B3				
	Fairless, Pa.	4.375 U1	5.375 U1				6.425 U1	7.925 U1				\$9.30 U1	\$8.00 U1	
	New Haven, Conn.													
Phoenixville, Pa.														
Sparrows Pt., Md.	4.325 B3	5.325 B3	5.85 B3			6.375 B3	7.875 B3	8.60 B3		5.125 B3	\$9.30 B3	\$8.00 B3		
Worcester, Mass.										5.325 A5				
Trenton, N. J.														
MIDDLE WEST	Alton, Ill.										5.20 L1			
	Ashland, Ky.	4.325 A7		5.85 A7	5.90 A7									
	Canton-Massillon, Dover, Ohio			5.85 R1, R3										
	Chicago, Joliet, Ill.	4.55 A1 4.325 W8					6.375 U1				5.025 A5, N4, R3			
	Sterling, Ill.										5.125 N4			
	Cleveland, Ohio	4.325 J3, R3	5.325 J3, R3		5.90 R3		6.375 J3, R3	7.875 J3, R3			5.025 A5			
	Detroit, Mich.	4.425 G3, M2	5.425 G3 5.325 M2				6.475 G3	7.975 G3						
	Newport, Ky.	4.325 N5	5.325 N5	5.85 N5										
	Gary, Ind. Harbor, Indiana	4.325 J3, U1, Y1	5.325 J3, U1, Y1	5.85 U1, J3	5.90 U1, J3	6.25 U1	6.375 Y1, U1, J3	7.875 U1, Y1			5.025 Y1	\$9.20 J3, U1, Y1	\$7.90 J3, U1, Y1	6.65 U1, Y1
	Granite City, Ill.	4.525 G2	5.525 G2	6.05 G2	6.10 G2								\$8.00 G2	6.75 G2
	Kokomo, Ind.	4.425 C9		5.95 C9						5.475 C9	5.125 C9			
	Mansfield, Ohio	4.325 E2	5.325 E2			6.25 E2				E2				
	Middletown, Ohio		5.325 A7	5.85 A7	5.90 A7	6.25 A7								
	Niles, Warren, Ohio Sharon, Pa.	4.325 S1, R3, N3	5.325 R3, N3	5.85 R3 5.85 N3	5.90 N3	6.25 N3	6.375 S1, R3	7.875 R3				\$9.20 R3	\$7.90 R3	
Pittsburgh, Pa. Midland, Pa. Butler, Pa.	4.325 J3, U1, P6	5.325 J3, U1, P6	5.85 U1	5.90 U1, A7		6.375 J3, U1	7.875 U1	8.60 U1		5.025 A5, P6	\$9.20 J3, U1	\$7.90 J3, U1	6.65 U1	
Portsmouth, Ohio	4.325 P7	5.325 P7								5.025 P7				
Weirton, Wheeling, Follensbee, W. Va.	4.325 W3, W5	5.325 W3, W5, P3	5.85 W3, W5		6.25 W3, W5	6.375 W3	7.875 W3				\$9.20 W3, W5	\$7.90 W3, W5	6.65 F3, W5	
Youngstown, Ohio	4.325 U1, Y1	5.325 Y1		5.90 Y1		6.375 U1, Y1	7.875 Y1			5.025 Y1				
WEST	Fontana, Cal.	5.075 K1	6.425 K1				7.125 K1	8.975 K1						
	Gonova, Utah	4.425 C7												
	Kansas City, Mo.										5.275 S2			
	Los Angeles, Torrance, Cal.										5.825 B2			
	Minneapolis, Colo.										5.275 C6			
	San Francisco, Niles, Pittsburg, Cal.	5.025 C7	6.275 C7	6.60 C7							5.675 C7	\$9.95 C7	\$8.65 C7	
	Seattle, Wash.													
SOUTH	Atlanta, Ga.													
	Fairfield, Ala. Alabama City, Ala.	4.325 R3, T2	5.325 T2	5.85 R3, T2			6.375 T2			5.625 R3, T2	\$9.30 T2	\$8.00 T2		
	Houston, Tex.										5.275 S2			

IRON AGE		Italics identify producers listed in key at end of table. Base prices, f.a.b. mill, in cents per lb., unless otherwise noted. Extras apply.										
STEEL PRICES (Effective Dec. 26, 1955)		BARS						PLATES				WIRE
		Carbon Steel	Reinforcing	Cold Finished	Alloy Hot-rolled	Alloy Cold Drawn	Hi Str. H.R. Low Alloy	Carbon Steel	Flat Plate	Alloy	Hi Str. Low Alloy	Mfr's. Bright
EAST	Bothlehem, Pa.				5.575 B3	7.425 B3	6.80 B3					
	Buffalo, N. Y.	4.65 B3,R3	4.65 B3,R3	5.95 B5	5.575 B3,R3	7.425 B3,B5	6.80 B3	4.50 B3,R3				6.25 W6
	Claymont, Del.							4.80 C4		6.30 C4	6.725 C4	
	Coatesville, Pa.							4.80 L4		6.30 L4	6.725 L4	
	Conshohocken, Pa.							4.50 A2	5.575 A2		6.725 A2	
	Harrisburg, Pa.							5.10 P2	5.575 C3			
	Hartford, Conn.			6.40 R3		7.725 R3						
	Johstown, Pa.	4.65 B3	4.65 B3		5.575 B3		6.80 B3	4.50 B3		6.30 B3	6.725 B3	6.25 B3
	Fairless, Pa.	4.80 U1	4.80 U1		5.725 U1							
	Newark, N. J.			6.35 W10		7.60 W10						
	Camden, N. J.			6.35 P10								
	Bridgeport, Putnam, Conn.	4.80 N8		6.45 W10	5.725 N8			4.750 N8				
	Sperrows Pt., Md.		4.65 B3					4.50 B3		6.30 B3	6.725 B3	6.35 B3
	Palmer, Worcester, Readville, Mass.			6.35 W11 6.45 B5,C14		7.725 A5,B5		4.80 R3				6.55 A5, W6
	Spring City, Pa.			6.35 K4		7.60 K4						
MIDDLE WEST	Alton, Ill.	4.85 L1										6.425 L1
	Ashtland, Newport, Ky.							4.50 A7,N5		6.30 N5		
	Canton-Massillon, Mansfield, Ohio	4.75 R3		5.90 R3,R3	5.575 R3,T3	7.425 R2,R3, T3		4.50 B2				
	Chicago, Joliet, Ill.	4.65 U1, N4,W8,R3, P13	4.65 N4,R3, P13	5.90 A5,W10, W8,B5,L2	5.575 U1,R3, W8	7.425 A5,W8, W10,L2,B5		4.50 U1,W8, T3,A1,R3	5.575 U1	6.30 U1	6.725 U1	6.25 A5,R3, N4,W7
	Cleveland, Ohio	4.85 R3	4.85 R3	5.90 A5,C13		7.425 A5,C13	6.80 R3	4.80 J3,R3	5.575 J3		6.725 R3,J3	6.25 A5, C13
	Detroit, Mich.	4.75 G3	4.75 G3	5.90 R5 6.10 B5,P8 6.15 P3	5.575 R5 5.675 G3	7.425 R5 7.625 B5,P3 P8	6.80 G3	4.80 G3			6.825 G3	
	Duluth, Minn.											6.25 A5
	Gary, Ind. Harbor, Crawfordsville	4.65 I3, U1, Y1	4.65 I3, U1, Y1	5.90 M5,R3	5.575 I3, U1, Y1	7.425 M5, R3	6.80 U1,I3, Y1	4.50 I3, U1,Y1	5.575 J3	6.30 U1,Y1	6.725 U1, I3,Y1	6.35 M4
	Granite City, Ill.							4.70 G2				6.35 C9
	Kokomo, Ind.											6.35 N4
	Sterling, Ill.	4.75 N4	4.75 N4									
	Niles, Warren, Ohio Sharon, Pa.	4.65 R3,C10		5.90 C10	5.575 C10	7.425 C10	6.80 R3	4.50 S1,R3		6.30 S1	6.725 S1	
	Pittsburgh, Pa. Midland, Pa.	4.65 J3, U1, C11	4.65 J3, U1	5.90 A5,C8, C11,J3, W10,B4,R3	5.575 U1,C11	7.425 A5,C11, W10,C8,R3	6.80 J3, U1	4.50 J3, U1	5.575 U1	6.30 U1	6.725 J3, U1	6.25 A5,J3, P6
	Portsmouth, Ohio											6.25 P7
	Wornton, Wheeling, Follansbee, W. Va.	4.65 W3						4.50 W3,W3				
	Youngstown, Ohio	4.65 U1,Y1, C10,R3	4.65 U1,Y1, R3	5.90 Y1, U1	5.575 U1,Y1, C10	7.425 Y1,C10 P2	6.80 U1,Y1	4.50 U1,Y1, R3		6.30 Y1	6.725 Y1	6.25 Y1
WEST	Emeryville, Cal.	5.40 J3	5.40 J3									
	Fontana, Cal.	5.35 K1	5.35 K1		6.625 K1		7.50 K1	5.15 K1		6.95 K1	7.375 K1	
	Gonova, Utah							4.50 C7			6.725 C7	
	Kansas City, Mo.	4.90 S2	4.90 S2		5.825 S2		7.85 S2					6.50 S2
	Los Angeles, Torrance, Cal.	5.35 B2,C7	5.35 B2,C7	7.35 R3	6.825 B2		7.50 B2				7.825 B2	7.20 B2
	Minnequa, Colo.	5.10 C6	5.10 C6					5.35 C6				6.50 C6
	Portland, Ore.	5.40 O2	5.40 O2									
	San Francisco, Niles, Pittsburg, Cal.	5.35 C7 5.40 B2,P9	5.35 C7 5.40 B2,P9				7.55 B2					7.20 C7
	Seattle, Wash.	5.40 B2,P12, N6	5.40 B2,P12				7.55 B2	5.40 B2		7.30 B2	7.425 B2	
SOUTH	Atlanta, Ga.	4.85 A8	4.85 A8									6.45 A8
	Fairfield, Ala. City, Birmingham, Ala.	4.65 T2,R3 5.15 C16	4.65 T2,R3 5.15 C16				6.80 T2	4.80 T2,R3			6.725 T2	6.25 R3, T2
	Houston, Ft. Worth, Lane Star, Tex.	4.90 S2	4.90 S2		5.825 S2		7.85 S2	4.85 L3 4.80 S2		6.40 S2	6.825 S2	6.50 S2

Steel Prices (Effective Dec. 20, 1955)

Key to Steel Producers

With Principal Offices

- A1 Acme Steel Co., Chicago
A2 Alan Wood Steel Co., Conshohocken, Pa.
A3 Allegheny Ludlum Steel Corp., Pittsburgh
A4 American Clad Metals Co., Carnegie, Pa.
A5 American Steel & Wire Div., Cleveland
A6 Angell Nail & Chaplet Co., Cleveland
A7 Armco Steel Corp., Middletown, O.
A8 Atlantic Steel Co., Atlanta, Ga.
B1 Babcock & Wilcox Tube Div., Beaver Falls, Pa.
B2 Bethlehem Pacific Coast Steel Corp., San Francisco
B3 Bethlehem Steel Co., Bethlehem, Pa.
B4 Blair Strip Steel Co., New Castle, Pa.
B5 Bliss & Laughlin, Inc., Harvey, Ill.
B6 Brook Plant, Wickwire Spencer Steel Div., Birdsboro, Pa.
C1 Calstrip Steel Corp., Los Angeles
C2 Carpenter Steel Co., Reading, Pa.
C3 Central Iron & Steel Co., Harrisburg, Pa.
C4 Claymont Products Dept., Claymont, Del.
C5 Cold Metal Products Co., Youngstown, O.
C6 Colorado Fuel & Iron Corp., Denver
C7 Columbia Geneva Steel Div., San Francisco
C8 Columbia Steel & Shifting Co., Pittsburgh
C9 Continental Steel Corp., Kokomo, Ind.
C10 Copperweld Steel Co., Pittsburgh, Pa.
C11 Crucible Steel Co. of America, Pittsburgh
C12 Cumberland Steel Co., Cumberland, Md.
C13 Cuyahoga Steel & Wire Co., Cleveland
C14 Compressed Steel Shifting Co., Readville, Mass.
C15 G. O. Carlson, Inc., Monroeville, Pa.
C16 Connors Steel Div., Birmingham
C17 Chester Blast Furnace Inc., Chester, Pa.
D1 Detroit Steel Corp., Detroit
D2 Detroit Tube & Steel Div., Detroit
D3 Driver Harris Co., Harrison, N. J.
D4 Dickson Weatherproof Nail Co., Evanston, Ill.
D5 Henry Danton & Sons, Inc., Philadelphia
E1 Eastern Stainless Steel Corp., Baltimore
E2 Empire Steel Co., Mansfield, O.
F1 Firth Sterling, Inc., McKeesport, Pa.
F2 Fitzsimmons Steel Corp., Youngstown
F3 Follanabee Steel Corp., Follanabee, W. Va.
G1 Globe Iron Co., Jackson, O.

- G2 Granite City Steel Co., Granite City, Ill.
G3 Great Lakes Steel Corp., Detroit
G4 Greer Steel Co., Dover, O.
H1 Hanna Furnace Corp., Detroit
I1 Ingersoll Steel Div., Chicago
I2 Inland Steel Co., Chicago
I3 Interlake Iron Corp., Cleveland
J1 Jackson Iron & Steel Co., Jackson, O.
J2 Joseph Steel Corp., Washington, Pa.
J3 Jones & Laughlin Steel Corp., Pittsburgh
J4 Joslyn Mfg. & Supply Co., Chicago
J5 Judson Steel Corp., Emoryville, Calif.
K1 Kaiser Steel Corp., Fontana, Cal.
K2 Keystone Steel & Wire Co., Plover, Pa.
K3 Koppers Co., Granite City, Ill.
K4 Keystone Drawn Steel Co., Spring City, Pa.
L1 Laclede Steel Co., St. Louis
L2 La Salle Steel Co., Chicago
L3 Lane Star Steel Co., Dallas
L4 Lukens Steel Co., Coatesville, Pa.
M1 Mahoning Valley Steel Co., Niles, O.
M2 McLouth Steel Corp., Detroit
M3 Mercer Tube & Mfg. Co., Sharon, Pa.
M4 Mid-States Steel & Wire Co., Crawfordsville, Ind.
M5 Monarch Steel Div., Hammond, Ind.
M6 Mystic Iron Works, Everett, Mass.
N1 National Supply Co., Pittsburgh
N2 National Tube Div., Pittsburgh
N3 Niles Rolling Mill Div., Niles, O.
N4 Northwestern Steel & Wire Co., Sterling, Ill.
N5 Newport Steel Corp., Newport, Ky.
N6 Northwest Steel Rolling Mills, Seattle
N7 Newman Crosby Steel Co., Pawtucket, R. I.
N8 Northeastern Steel Corp., Bridgeport, Conn.
O1 Oliver Iron & Steel Co., Pittsburgh
O2 Oregon Steel Mills, Portland
P1 Page Steel & Wire Div., Monaca, Pa.
P2 Phoenix Iron & Steel Co., Phoenixville, Pa.
P3 Pilgrim Drawn Steel Div., Plymouth, Mich.
P4 Pittsburgh Coke & Chemical Co., Pittsburgh
P5 Pittsburgh Screw & Bolt Co., Pittsburgh
P6 Pittsburgh Steel Corp., Pittsburgh
P7 Portsmouth Div., Detroit Steel Corp., Detroit
P8 Plymouth Steel Co., Detroit

- P9 Pacific States Steel Co., Niles, Cal.
P10 Precision Drawn Steel Co., Camden, N. J.
P11 Production Steel Strip Corp., Detroit
P12 Pacific Steel Rolling Mills, Seattle
P13 Phoenix Mfg. Co., Joliet, Ill.
R1 Reeves Steel & Mfg. Co., Dover, O.
R2 Reliance Div., Eaton Mfg. Co., Massillon, O.
R3 Republic Steel Corp., Cleveland
R4 Roebing Sons Co., John A., Trenton, N. J.
R5 Rotary Electric Steel Co., Detroit
R6 Rodney Metals, Inc., New Bedford, Mass.
R7 Rome Strip Steel Co., Rome, N. Y.
S1 Sharon Steel Corp., Sharon, Pa.
S2 Sheffield Steel Corp., Kansas City
S3 Shenango Furnace Co., Pittsburgh
S4 Simonds Saw & Steel Co., Pittsburgh, Mass.
S5 Sweet's Steel Co., Williamsport, Pa.
S6 Standard Forging Corp., Chicago
S7 Stanley Works, New Britain, Conn.
S8 Superior Drawn Steel Co., Monaca, Pa.
S9 Superior Steel Corp., Carnegie, Pa.
S10 Seneca Steel Service, Buffalo
T1 Tonawanda Iron Div., N. Tonawanda, N. Y.
T2 Tennessee Coal & Iron Div., Fairfield
T3 Tennessee Products & Chem. Corp., Nashville
T4 Thomas Strip Div., Warren, O.
T5 Tinker Steel & Tube Div., Canton, O.
T6 Tremont Nail Co., Waltham, Mass.
T7 Texas Steel Co., Fort Worth
T8 Thompson Wire Co., Boston
U1 United States Steel Corp., Pittsburgh
U2 Universal-Cyclops Steel Corp., Bridgeville, Pa.
U3 Ulrich Stainless Steels, Wallingford, Conn.
U4 U. S. Pipe & Foundry Co., Birmingham
W1 Wallingford Steel Co., Wallingford, Conn.
W2 Washington Steel Corp., Washington, Pa.
W3 Weirton Steel Co., Weirton, W. Va.
W4 Wheatland Tube Co., Wheatland, Pa.
W5 Wheeling Steel Corp., Wheeling, W. Va.
W6 Wickwire Spencer Steel Div., Buffalo
W7 Wilson Steel & Wire Co., Chicago
W8 Wisconsin Steel Co., S. Chicago, Ill.
W9 Woodward Iron Co., Woodward, Ala.
W10 Wycoff Steel Co., Pittsburgh
W11 Worcester Pressed Steel Co., Worcester, Mass.
W12 Wallace Barnes Steel Div., Bristol, Conn.
Y1 Youngstown Sheet & Tube Co., Youngstown, O.

PIPE AND TUBING

Base discounts (per) f.o.b. mills. Base price about \$200 per net ton.

	BUTTWELD												SEAMLESS							
	1/2 in.		3/4 in.		1 in.		1 1/4 in.		1 1/2 in.		2 in.		2 1/2 in.		3 in.		3 1/2 in.			
	Bk.	Gal.	Bk.	Gal.	Bk.	Gal.	Bk.	Gal.	Bk.	Gal.	Bk.	Gal.	Bk.	Gal.	Bk.	Gal.	Bk.	Gal.	Bk.	Gal.
STANDARD T. & C.																				
Sparrows Pt. B3	16.50	1.25	19.50	5.25	22.00	8.75	24.50	9.50	25.00	10.50	25.50	11.00	27.00	10.75						
Youngstown R3	18.50	1.25	21.50	5.25	24.00	8.75	26.50	10.00	27.00	11.00	27.50	11.50	29.00	11.75						
Fontana K1	7.00	+8.25	10.00	+4.25	16.50	+7.75	15.00	+0.00	15.50	1.00	16.00	1.50	17.50	1.25						
Pittsburgh J3	18.50	1.25	21.50	7.25	24.00	10.75	26.50	11.50	27.00	12.50	27.50	13.00	29.00	12.75	6.50	+8.50	10.50	+6.25	13.00	+3.75
Alton, Ill. L1	16.50	1.25	19.50	5.25	22.00	8.75	24.50	9.50	25.00	10.50	25.50	11.00	27.00	10.75						
Sharon M3	18.50	3.25	21.50	7.25	24.00	10.75	26.50	11.50	27.00	12.50	27.50	13.00	29.00	12.75						
Fairless N2	16.50	1.25	19.50	5.25	22.00	8.75	24.50	9.50	25.00	10.50	25.50	11.00	27.00	10.75						
Pittsburgh N1	18.50	3.25	21.50	7.25	24.00	10.75	26.50	11.50	27.00	12.50	27.50	13.00	29.00	12.75	6.50	+8.50	10.50	+6.25	13.00	+3.75
Wheeling W5	18.50	3.25	21.50	7.25	24.00	10.75	26.50	11.50	27.00	12.50	27.50	13.00	29.00	12.75						
Wheatland W4	18.50	3.25	21.50	7.25	24.00	10.75	26.50	11.50	27.00	12.50	27.50	13.00	29.00	12.75						
Youngstown Y1	18.50	3.25	21.50	7.25	24.00	10.75	26.50	11.50	27.00	12.50	27.50	13.00	29.00	12.75	6.50	+8.50	10.50	+6.25	13.00	+3.75
Indiana Harbor Y1	17.50	2.25	20.50	6.25	23.00	9.75	25.50	10.00	26.00	11.50	26.50	12.00	28.00	11.75						
Lorain N2	18.50	3.25	21.50	7.25	24.00	10.75	26.50	11.50	27.00	12.50	27.50	13.00	29.00	12.75	6.50	+8.50	10.50	+6.25	13.00	+3.75
EXTRA STRONG PLAIN ENDS																				
Sparrows Pt. B3	21.00	7.25	25.00	11.25	27.00	14.75	27.50	13.50	28.00	14.50	28.50	15.00	29.00	13.75						
Youngstown R3	23.00	7.25	27.00	11.25	29.00	14.75	29.50	14.00	30.00	15.00	30.50	15.50	31.00	14.75						
Fairless N2	21.00	7.25	25.00	11.25	27.00	14.75	27.50	13.50	28.00	14.50	28.50	15.00	29.00	13.75						
Fontana K1	11.50					16.00														
Pittsburgh J3	23.00	9.25	27.00	13.25	29.00	16.75	29.50	15.50	30.00	16.50	30.50	17.00	31.00	15.75	8.00	+6.00	13.00	+2.75	15.50	+6.25
Alton, Ill. L1	21.00	7.25	25.00	11.25	27.00	14.75	27.50	13.50	28.00	14.50	28.50	15.00	29.00	13.75						
Sharon M3	23.00	9.25	27.00	13.25	29.00	16.75	29.50	15.50	30.00	16.50	30.50	17.00	31.00	15.75						
Pittsburgh N1	23.00	9.25	27.00	13.25	29.00	16.75	29.50	15.50	30.00	16.50	30.50	17.00	31.00	15.75	8.00	+6.00	13.00	+2.75	15.50	+6.25
Wheeling W5	23.00	9.25	27.00	13.25	29.00	16.75	29.50	15.50	30.00	16.50	30.50	17.00	31.00	15.75						
Wheatland W4	23.00	9.25	27.00	13.25	29.00	16.75	29.50	15.50	30.00	16.50	30.50	17.00	31.00	15.75						
Youngstown Y1	23.00	9.25	27.00	13.25	29.00	16.75	29.50	15.50	30.00	16.50	30.50	17.00	31.00	15.75	8.00	+6.00	13.00	+2.75	15.50	+6.25
Indiana Harbor Y1	22.00	8.25	26.00	12.25	28.00	15.75	28.50	14.50	29.00	15.50	29.50	16.00	30.00	14.75						
Lorain N2	21.00	9.25	27.00	13.25	29.00	16.75	29.50	15.50	30.00	16.50	30.50	17.00	31.00	15.75	8.00	+6.00	13.00	+2.75	15.50	+6.25

Threads only, butt-weld and seamless 2 1/2 pt higher discount. Plain ends, butt-weld and seamless, 3-in. and under, 5 1/2 pt higher discount. Galvanized discounts based on zinc price range of over 9¢ to 11¢ per lb. East St. Louis. For each 2¢ change in zinc, discounts vary as follows: 1/2, 3/4 and 1-in., 2 pt.; 1 1/4, 1 1/2 and 2 in., 1 1/2 pt.; 2 1/2 and 3-in., 1 pt. e.g., zinc price range of over 11¢ to 13¢ would lower discounts; zinc price in range over 7¢ to 9¢ would increase discounts. East St. Louis zinc price now 13.00¢ per lb.

TOOL STEEL

F.o.b. mill	W	Cr	V	Mo	Co	per lb
18	4	1	—	—	—	\$1.60
18	4	2	—	—	—	2.80
18	4	2	—	—	—	1.765
1.5	4	1.5	8	—	—	.96
8	4	3	8	—	—	1.35
8	4	3	8	—	—	1.105
High-carbon chromium						
Oil hardened manganese						
Special carbon						
Extra carbon						
Regular carbon						
Warehouse prices on and east of Mississippi are 4¢ per lb higher. West of Mississippi, 6¢ higher.						

CLAD STEEL

Base prices, cents per lb f.o.b.

Cladding	Plate (A3, J2, L6)			Sheet (J2)
	10 pt	15 pt	20 pt	20 pt
304	36.30	33.15	36.05	32.50
316	35.50	32.45	41.40	47.00
321	32.00	34.85	37.75	37.25
347	34.40	37.90	41.40	48.25
405	25.00	29.60	33.35	—
416, 430	25.30	29.10	32.85	—

CR Strip (89) Copper, 10 pt, 2 sides, 88.00; 1 side, 80.00.

WAREHOUSES

City	Delivery Charge	Sheets		Strip		Plates		Shapes		Bars		Alloy Bars			
		Hot-Rolled	Cold-Rolled	Hot-Rolled	Cold-Rolled	Standard	Structural	Hot-Rolled	Cold-Finished	Hot-Rolled	Cold-Finished	Hot-Rolled	Hot-Rolled	Cold-Drawn	Cold-Drawn
Baltimore	8.10	7.93	8.32	8.37	7.65	7.21	7.93	7.61	8.82	14.38	13.44	16.36	16.29	16.49	16.49
Birmingham	15	6.60	7.93	8.65	7.66	6.99	7.28	7.08	9.35	—	—	—	—	—	—
Boston	19	7.70	8.91	10.27	7.94	7.09	8.13	7.83	9.53	12.15	13.40	16.65	16.50	—	—
Butte	30	6.89	7.90	9.70	7.15	7.15	7.60	7.10	7.90	13.80	13.45	13.10	16.15	—	—
Chicago	25	6.80	8.09	8.50	7.66	6.99	7.28	7.68	7.75	13.20	12.85	16.05	15.90	—	—
Cincinnati	25	6.92	8.33	8.90	7.50	7.28	7.75	7.32	8.95	13.44	31.09	16.29	16.14	—	—
Cleveland	30	6.80	8.09	8.85	7.18	7.18	7.61	7.14	7.85	—	12.91	—	15.96	—	—
Dallas	8.00	10.74	11.22	8.90	—	8.00	8.75	8.90	9.82	—	—	—	17.97	—	—
Detroit	25	6.99	8.28	8.78	7.34	7.27	7.75	7.36	8.04	13.40	13.05	16.25	16.10	—	—
Houston	7.85	8.75	10.49	8.15	—	7.86	8.20	8.25	9.85	14.35	14.00	17.15	17.05	—	—
Kansas City	20	7.47	8.76	9.17	7.73	7.66	7.95	7.75	8.52	13.87	13.32	16.72	16.57	—	—
Los Angeles	10	8.05	10.00	11.00	8.35	8.05	8.30	8.05	11.25	—	14.25	—	17.85	—	—
Memphis	10	7.13	8.25	—	7.30	7.31	7.60	7.40	9.15	—	—	—	—	—	—
Milwaukee	25	6.89	8.16	8.59	7.15	7.06	7.45	7.17	7.94	—	12.94	—	15.99	—	—
New Orleans	15	7.20	8.35	—	7.45	7.80	7.70	7.50	9.55	—	—	—	—	—	—
New York	10	7.46	8.65	9.44	8.07	7.78	7.99	7.96	9.48	13.63	13.28	16.48	16.33	—	—
Norfolk	20	7.25	—	—	7.65	7.45	7.95	7.65	9.50	—	—	—	—	—	—
Philadelphia	10	7.14	8.42	9.35	7.67	7.37	7.74	7.64	8.48	13.36	13.16	16.36	16.21	—	—
Pittsburgh	25	6.80	8.09	9.20	7.16	6.99	7.28	7.06	7.85	13.20	12.85	16.05	15.90	—	—
Portland	7.80	8.80	10.65	8.00	7.95	7.75	7.65	7.95	12.20	—	15.00	—	17.50	—	—
San Francisco	10	8.10	9.65	10.15	8.35	8.05	8.25	8.05	11.20	—	14.25	—	17.85	—	—
Seattle	10	8.35	10.40	10.90	8.65	8.20	8.30	8.35	11.70	—	14.00	—	17.65	—	—
St. Louis	25	7.09	8.38	9.19	7.35	7.28	7.68	7.37	8.14	13.89	13.14	16.35	16.19	—	—
St. Paul	25	7.48	8.59	9.16	7.72	7.65	7.94	7.74	8.51	—	13.51	—	16.31	—	—

Base Quantities (Standard unless otherwise keyed): Cold finished bars: 2000 lb or over. Alloy bars: 1000 to 1999 lb. All others: 2000 to 9999 lb. All HR products may be combined for quantity. All galvanized sheets may be combined for quantity. CR sheets may not be combined with each other or with galvanized sheets for quantity.

Exceptions: (1) 1600 to 1999 lb. (2) 1000 lb or over. (3) \$2.25 delivery. (4) 1000 to 1999 lb. \$2.25 delivery.

* Plus analysis charge.

ELECTRICAL SHEETS

22-Gage	F.o.b. Mill	Cents Per Lb	Hot-Rolled (Cut Lengths)*	Cold-Reduced (Coiled or Cut Length)	
				Semi-Processed	Fully Processed
Field	8.40	—	8.60	—	—
Armature	9.35	—	9.60	10.10	—
Elect.	9.95	—	10.20	10.70	—
Motor	10.95	—	11.20	11.70	—
Dynamo	11.85	—	12.10	12.60	—
Trans. 72	12.80	—	13.05	13.55	—
Trans. 65	13.35	—	—	—	—
Trans. 58	13.85	—	—	—	—
Trans. 52	14.85	—	—	—	—

Producing plants: Beach Bottom (W5); Brackensridge (A5); Granite City (G7); Indiana Harbor (I3); Mansfield (E2); Newport, Ky. (N5); Niles, O. (N3); Vandergrift (U7); Warren, O. (A3); Zanesville (A7).

* Coils 75¢ higher

LAKE SUPERIOR ORES

51.50% Fe; natural content, delivered lower Lake ports. Prices effective for 1955 season.

	Gross Ton
Openhearth lump	\$11.25
Old range, bessemer	10.40
Old range, nonbessemer	10.25
Messabi, bessemer	10.25
Messabi, nonbessemer	10.10
High phosphorus	10.00

MERCHANT WIRE PRODUCTS

F.o.b. Mill	Col	Col	Col	Col	Col	d/lb	d/lb
Alabama City R3	152	162	—	173	175	7.40	7.00
Aliquippa, Pa. J3	152	162	—	—	—	7.40	7.00
Atlanta A8	154	167	—	175	180	7.50	8.025
Bartonsville K2*	154	168	—	175	181	7.50	8.075
Buffalo W6	—	—	—	—	—	7.40	7.00
Chicago, Ill. N4**	152	166	—	173	179	7.40	8.00
Cleveland A6	157	—	—	—	—	7.40	—
Cleveland A5	—	—	—	—	—	7.40	—
Crawfordsville M4*	154	167	—	175	175	7.50	8.05
Danvers, Pa. A5	152	162	—	173	175	7.40	7.00
Duluth A5	152	162	—	173	175	7.40	7.00
Fairfield, Ala. T2	152	162	—	173	175	7.40	7.00
Galveston D4	157	170	—	—	—	7.45	8.05
Houston S2	157	170	—	—	—	7.45	8.05
Johnstown, Pa. B3*	152	166	—	175	175	7.40	7.00
Joliet, Ill. A5	152	162	—	173	175	7.40	7.00
Kokomo, Ind. C9	154	154	—	175	177	7.50	7.90
Los Angeles B2	—	—	—	—	—	8.35	8.925
Kansas City S2	167	174	—	180	180	7.65	8.05
Minneapolis C6	157	167	162	178	180	7.65	8.05
Monessen P6	152	162	—	—	—	7.40	7.00
Madison, Ill. R3	152	162	—	—	—	7.40	7.00
Pittsburg, Cal. C7	171	185	—	—	—	195	8.35
Portsmouth P7	—	—	—	—	—	7.40	—
Rancho, Pa. A5	152	162	—	175	175	7.40	7.00
So. Chicago R3	152	162	157	173	175	7.40	7.00
S. San Francisco C6	—	—	—	—	—	195	8.35
Sparrows Pt. B3*	154	—	—	175	181	7.50	8.075
Struthers, O. Y1	—	—	—	—	—	7.40	7.00
Worcester A5	158	—	—	—	—	7.70	—
Williamsport, Pa. S3	—	160	—	—	—	—	—

Galvanized products computed with zinc at 5¢ per lb. Exceptions: zinc at 12.5¢ per lb; **13¢ zinc.

C-R SPRING STEEL

Cents Per Lb	CARBON CONTENT			
	0.26-0.41	0.41-0.61	0.61-0.81	0.81-1.00
F.o.b. Mill	0.40	0.60	0.80	1.05
Bristol, Conn. W12	—	—	10.80	12.95
Buffalo, N. Y. R7	7.00	8.95	10.50	12.45
Carnegie, Pa. S9	—	8.95	10.50	12.45
Cleveland A5	7.10	9.05	10.60	12.75
Detroit D1	7.10	9.05	10.60	12.75
Detroit D2	7.10	9.05	10.60	12.75
Harrison, N. J. C11	—	—	10.80	12.95
Indianapolis C3	7.15	9.10	10.50	12.45
New Castle, Pa. B4	7.00	8.95	10.50	12.45
New Haven, Conn. D1	7.45	9.25	10.80	12.95
Pawtucket, R. I. N7	7.55	9.25	10.80	12.95
Pittsburgh S7	7.10	9.05	10.60	12.75
Riverdale, Ill. A1	7.10	8.95	10.50	12.45
Sharon, Pa. S1	7.00	8.95	10.50	12.45
Trenton R4	—	—	—	—
Wallingford W1	7.45	9.25	10.80	12.95
Warren, Ohio T4	7.00	8.95	10.50	12.45
Weirton, W. Va. W3	7.10	8.95	10.50	—
Worcester, Mass. A5	7.65	9.35	10.90	13.05
Youngstown C3	7.00	8.95	10.50	12.45

BOILER TUBES

\$ per 100 ft. coiled tube, cut 10 to 24 ft.	F.o.b. Mill	Size		Seamless		Elec. Weld	
		OD-In.	R.W. Ga.	H.R.	C.D.	H.R.	C.D.
Babcock & Wilcox	2	13	30.87	36.51	29.93	—	—
	2 1/2	12	41.57	49.16	40.31	—	—
	3	12	47.99	56.78	46.55	—	—
	3 1/2	11	56.03	66.27	54.34	—	—
	4	10	74.41	88.00	72.17	—	—
National Tube	2	13	30.87	36.51	29.93	—	—
	2 1/2	12	42.57	49.16	40.31	—	—
	3	12	47.99	56.78	46.55	—	—
	3 1/2	11	56.03	66.27	54.34	—	—
	4	10	74.41	88.00	72.17	—	—
Pittsburgh Steel	2	13	30.87	36.51	29.93	—	—
	2 1/2	12	41.57	49.16	40.31	—	—
	3	12	47.99	56.78	46.55	—	—
	3 1/2	11	56.03	66.27	54.34	—	—
	4	10	74.41	88.00	72.17	—	—

RAILS, TRACK SUPPLIES

F.o.b. Mill Cents Per Lb.	No. 1 Std. Rail	Light Rail	Joint Bar	Track Spikes	Stove Spikes	Tie Plates	Track Bolts Treated
Bessemer U.I.	4.725	5.45	5.825				
Se. Chicago R.R.	4.725	5.45	7.90				
Emaley T.I.	5.45		7.90	5.625			
Fairfield T.I.	5.45		7.90	5.625			
Gary U.I.	4.725	5.45		5.625			
Ind. Harbor T.I.	4.725	5.45	7.90	5.525			
Johnstown B.I.	5.45						
Joliet U.I.	5.45	5.825					
Kansas City S.I.	4.725	5.45	7.90				
Larkensville B.I.	4.725	5.45	7.90	5.625			
Minneapolis C.I.	4.725	5.45	7.90	5.625	12.40		
Pittsburgh O.I.					11.90		
Pittsburgh P.I.						12.40	
Pittsburgh T.I.			7.90				
Seattle B.I.			8.40			5.775	12.90
Seattle B.I.	4.725	5.45	7.90			5.775	
Strubbers T.I.			7.90				
Torrance C.I.						5.775	
Williamport S.I.	5.45						
Youngstown R.I.			7.90				

COKE

Furnace, beehive (f.o.b. oven)	Net-Ton
Connellsville, Pa.	\$14.00 to \$14.50
Foundry, beehive (f.o.b. oven)	
Connellsville, Pa.	\$16.00 to \$16.50
Foundry, oven coke	
Buffalo, del'd	\$28.08
Chicago, f.o.b.	26.76
Detroit, f.o.b.	26.25
New England, del'd	26.05
Seaboard, N. J., f.o.b.	25.50
Philadelphia, f.o.b.	25.00
Swedeland, Pa., f.o.b.	25.00
Plainesville, Ohio, f.o.b.	25.50
Erie, Pa., f.o.b.	25.00
Cleveland, del'd	27.43
Cincinnati, del'd	26.56
St. Paul, f.o.b.	23.75
St. Louis, f.o.b.	26.00
Birmingham, f.o.b.	24.40
Lone Star, Tex., f.o.b.	19.50

ELECTRODES

Cents per lb, f.o.b. plant, threaded, with nipples, unboxed.

GRAPHITE			CARBON*		
Diam. (in.)	Length (in.)	Price	Diam. (in.)	Length (in.)	Price
24	84	23.90	40	100, 110	9.90
18	72	22.25	35		9.90
18 to 18	72	22.50	30	110	10.05
14	72	23.00	24	72 to 84	10.30
12	72	23.50	20	90	10.10
10	60	24.25	17	72	10.35
7	60	24.50	14	72	10.85
6	60	27.25	12	60	11.75
4	60	30.25	10	60	11.80
3	60	32.90	8	60	12.10
2 1/2	60	33.75			
2	24	52.50			

* Prices shown cover carbon nipples.

ELECTROPLATING SUPPLIES

Anodes	
(Cents per lb., 1st allowed in quantity)	
Copper	
Cast elliptical, 18 in. or longer,	58.92
5000 lb lots	55.25
Electrodeposited	
Brass, 80-20, ball anodes, 2000 lb	58.00
or more	20.75
Zinc, ball anodes, 2000 lb. lots	
(for elliptical add 3¢ per lb)	
Nickel, 99 pct plus, rolled carbon	90.50
(rolled depolarized add 3¢ per lb)	
Cadmium	\$1.70
Tin, ball anodes and elliptical \$1.06 to \$1.10	
Chemicals	
(Cents per lb., fob shipping point)	
Copper cyanide, 100 lb drum	\$2.50
Copper sulphate, 5 or more 100 lb	
bags, per cwt	18.15
Nickel anite, single, 4-100 lb bags	33.25
Nickel chloride, freight allowed,	
300 lbs	48.50
Sodium cyanide, domestic, fob N. Y.	
1 to 4 200 lb drums	21.55
(Philadelphia add .50 per lb)	
Zinc cyanide, 100 to 900 lb	55.55
Potassium cyanide, 100 lb drum	
N. Y.	48.00
Chromic acid, flake type, 1 to 20	
100 lb drums	31.20

BOLTS, NUTS, RIVETS, SCREWS

(Base discount, f.o.b. mill)

Machine and Carriage Bolt

	Discounts	
	Full case	Full case
	case	50,000 lb.
	Quantity	or more
1/2 in. & smaller x 6 in. &	61	63
shorter		
Larger than 1/2 in. diam. and	58	57
all diam. longer than 6 in.		
Roll thread carriage bolts		
1/2 in. & smaller x 6 in. and	61	63
shorter		
Lag, all diam. x 8 in. &	61	63
shorter		
Lag, all diam. longer than	58	57
6 in.		
Plow bolts	61	63

Nuts, Hex., H.P., reg. & hvy.

1/2" or smaller	64	66
3/4" to 1 1/4" inclusive	65	67
1 1/2" to 1 3/4" inclusive	66	68
1 3/4" and larger	61	63

C.P. Hex. regular & hvy.

1/2" or smaller	64	66
3/4" and larger	61	63

Hot Galv. Nuts (all types)

1 1/2" or smaller	44	47
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Finished, Semi-finished, Hex. Nuts

1/2" and smaller	66	68
3/4" and larger	63	65
Add 25¢ for less than case or keg quantity.		

Rivets

	Base per 100 lb
1/2 in. and larger	\$9.95
7/16 in. and smaller	Per Off List
	32

Cap Screws

	Discount	
	B.O. Heat	
Bright Treated		
New std. hex head, pack-		
aged		
1/2" thru 1 1/2" diam. x 6"	34	30
and shorter		
9/16 and 5/8 x 6" and	31	16
smaller and shorter		
1/2, 3/4, 1" x 8" and	6	11
shorter		
New std. hex head, bulk*		
1/2" thru 1 1/2" diam. x 6"	49	41
and shorter		
9/16 and 5/8 diam. x 6"	48	39
and shorter		
1/2, 3/4, 1" x 8" and	31	30
shorter		
*Minimum quantity per item:		
15,000 pieces 1/2", 5/16", 3/8" diam.		
5,000 pieces 7/16", 1/2", 9/16", 5/8" diam.		
2,000 pieces 3/4", 1", 1 1/4" diam.		

Machine Screws & Stove Bolts

	Discount	
	Mach. Screws	Stove Bolts
Packaged, package list	27	33
Bulk, bulk list		
Quantity		
1/4-in. diam.	25,000-100,000	30
5/16-in. diam. & larger	15,000-100,000	30
All diam. over 3 in. long	5,000-100,000	61

Machine Screw & Stove Bolt Nuts

	Discount	
	Hex Square	
Packaged, package list	34	27
Bulk, bulk list		
Quantity		
1/2-in. diam. & smaller	25,000-200,000	18
		20

CAST IRON WATER PIPE INDEX

Birmingham	109.3
New York	121.6
Chicago	122.9
San Francisco-L.A.	131.1
Nov. 1955 value, Class B or heavier	
6 in. or larger, bell and spigot pipe. Na-	
pensation: p. 57, Sept. 1 issue. Source:	
U. S. Pipe and Foundry Co.	

REFRACTORIES

Fire Clay Brick	Carloads per 1000
First quality, Ill., Ky., Md., Mo., Ohio, Pa.,	
(except Salina, Pa., add \$5.00)	\$123.00
No. 1 Ohio	
Sec. quality, Pa., Md., Ky., Mo., Ill.	114.00
No. 2 Ohio	98.00
Ground fire clay, net ton, bulk (ex-	
cept Salina, Pa., add \$1.50)	18.00

Silica Brick

Mt. Union, Pa., Ensley, Ala.	\$128.00
Childs, Hays, Pa.	132.00
Chicago District	138.00
Western Utah	144.00
California	161.00
Super Duty	
Hays, Pa., Athens, Tex., Wind-	
ham, Warren, O.	145.00
Curtner, Calif.	163.00
Silica cement, net ton, bulk, East-	
ern (except Hays, Pa.)	21.00
Silica cement, net ton, bulk, Hays,	
Pa.	24.00
Silica cement, net ton, bulk, Chi-	
cago District, Ensley, Ala.	22.00
Silica cement, net ton, bulk, Utah	
and Calif.	32.00

Chrome Brick

Standard chemically bonded, Balt.	\$91.00
Standards chemically bonded, Curt-	
ner, Calif.	101.21
Burned, Balt.	85.00

Magnesite Brick

Standard Baltimore	\$114.00
Chemically bonded, Baltimore	102.00

Grain Magnesite

Domestic, f.o.b. Baltimore	St. %-in. grains
In bulk fines removed	\$64.00
Domestic, f.o.b. Chewelah, Wash.,	
Luning, Nev.	40.00
In sacks	46.00

Dead Burned Dolomite

F.o.b. bulk, producing points in:	Per net ton
Pa., W. Va., Ohio	\$15.00
Midwest	16.00
Missouri Valley	14.00

METAL POWDERS

Per pound, f.o.b. shipping point, in ton	
lots, for minus 100 mesh.	
Swedish sponge iron c.i.f.	
New York, ocean bags	9.50¢
Canadian sponge iron,	
Del'd in East, carloads	9.5¢
Domestic sponge, iron, 98+%	
Fe, carload lots	9.5¢
Electrolytic iron, annealed,	
imported 99.5+% Fe	27.5¢
domestic 99.5+% Fe	26.5¢
Electrolytic iron, unannealed	
minus 325 mesh, 99+% Fe	27.0¢
Electrolytic iron melting	
stock, 99.84% pure	22.0¢
Carbonyl iron, size 6 to 10	
micron, 98%, 90.8+% Fe	86.0¢ to \$1.55
Aluminum freight allowed	34.50¢
Brass, 10 ton lots	\$7.50¢ to \$8.00¢
Copper, electrolytic	61.50¢
Copper, reduced	61.50¢
Cadmium, 100-199 lb. 99¢ plus metal value	
Chromium, electrolytic, 99%	
min., and quality, del'd.	\$3.60
Lead	7.50¢ plus metal value
Manganese	70.0¢
Molybdenum, 99%	\$3.00 to \$3.25
Nickel, unannealed	\$1.00
Nickel, annealed	\$1.00
Nickel, spherical, unannealed,	
280	\$1.18
Silicon	42.50¢
Solder powder .70¢ to 9.0¢ plus met. value	
Stainless steel, 302	99.0¢
Stainless steel, 316	\$1.22
Tin	14.00¢ plus metal value
Tungsten, 99% (66 mesh)	\$4.50
Zinc, 10 ton lots	18.75¢ to 32.50¢

Ferroalloy Prices

(Effective Dec. 20, 1955)

Ferrochrome

Contract prices, cents per lb contained Cr, lump, bulk, carloads, del'd, 67-71% Cr, 30-1.00% max. Si.

0.02% C	35.50	0.20% C	35.50
0.04% C	35.50	0.50% C	35.55
0.10% C	35.90	1.00% C	34.00
0.15% C	35.75	2.00% C	32.75
4.00-4.50 C	37.70% Cr, 1-2% Si		34.25
2.50-5.00% C, 57-64% Cr, 2.00-4.00% Si			25.90

S. M. Ferrochrome

Contract prices, cents per pound, chromium contained, lump size, delivered.

High carbon type: 60-65% Cr, 4-6% Si, 4-6% Mn, 4-6% C.

Carloads	25.65
Ton lots	30.55
Less ton lots	32.05

High Nitrogen Ferrochrome

Low-carbon type 0.75% N. Add 3¢ per lb to regular low carbon ferrochrome price schedule. Add 3¢ for each additional 0.25% of N.

Chromium Metal

Contract prices, per lb chromium contained, packed, delivered, ton lots, 97% min. Cr, 1% max. Fe.

0.10% max. C	\$1.27
0.50% max. C	1.27
9 to 11% C, 88-91% Cr, 0.75% Fe	1.36

Low Carbon Ferrochrome Silicon

(Cr 34-41%, Si 42-45%, C 0.05% max.)

Contract prices, carloads, delivered, lump, 2-in. x down, per lb of Cr, packed.

Carloads	41.85
Ton lots	44.15
Less ton lots	48.65

Calcium-Silicon

Contract price per lb of alloy, lump, delivered, packed.

20-25% Cr, 60-65% Si, 3.00 max. Fe.

Carloads	22.95
Ton lots	25.25
Less ton lots	26.75

Calcium-Manganese-Silicon

Contract prices, cents per lb of alloy, lump, delivered, packed.

16-20% Ca, 14-18% Mn, 53-59% Si.

Carloads	23.05
Ton lots	24.95
Less ton lots	25.95

SMZ

Contract prices, cents per pound of alloy, delivered, 60-65% Si, 5-7% Mn, 5-7% Zr, 20% Fe 1/4 in. x 13 mesh.

Ton lots	19.65
Less ton lots	20.90

V Foundry Alloy

Cents per pound of alloy, f.o.b. Suspension Bridge, N. Y., freight allowed, max. St. Louis, V-8; 38-42% Cr, 17-19% Si, 8-11% Mn, packed.

Carload lots	16.70
Ton lots	18.70
Less ton lots	19.95

Graphidex No. 4

Cents per pound of alloy, f.o.b. Suspension Bridge, N. Y., freight allowed, max. St. Louis. Si 48 to 52%, Ti 9 to 11%, Ca 5 to 7%.

Carload packed	18.50
Ton lots to carload packed	19.45
Less ton lots	20.90

Ferromanganese

Maximum contract base price, f.o.b., lump size, base content 74 to 76 pct Mn.

Producing Point	Cents per lb
Marietta, Ashtabula, O.; Alloy, W. Va.; Sheffield, Ala.; Portland, Ore.	9.50
Chairton, Pa.	9.50
Sheridan, Pa.	10.25
Philo, Ohio	9.50

Add or subtract 0.1¢ for each 1 pct Mn above or below base content.

Briquets, delivered, 66 pct Mn:	
Carloads, bulk	12.10
Ton lots packed	14.30

Spiegeleisen

Contract prices, per gross ton, lump, f.o.b. Palmerton, Pa.

Manganese	Silicon	Price
16 to 19%	3% max.	\$89.50
19 to 21%	3% max.	91.50
21 to 23%	3% max.	94.00

Manganese Metal

Contract basis, 2 in. x down, cents per pound of metal, delivered.

95.50% min. Mn, 0.2% max. C, 1% max. Si, 2.5% max. Fe.

Carload, packed	45.00
Ton lots	43.50

Electrolytic Manganese

F.o.b. Knoxville, Tenn., freight allowed east of Mississippi, f.o.b. Marietta, O., delivered, cents per pound.

Carloads	30.00
Ton lots	32.00
250 to 1999 lb	34.00
Premium for hydrogen-removed metal	0.75

Medium Carbon Ferromanganese

Mn 80% to 85%, C 1.25 to 1.50, Si 1.50% max. Contract price, carloads, lump, bulk, delivered, per lb of contained Mn.

	21.85
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Low-Carb Ferromanganese

Contract price, cents per pound Mn contained, lump size, del'd Mn 85-90%.

Carloads	Ton	Less	
0.07% max. C, 0.06% P, 90% Mn	32.00	23.85	35.05
0.07% max. C	29.95	31.80	33.80
0.15% max. C	28.45	30.30	31.50
0.30% max. C	26.95	28.80	30.00
0.50% max. C	26.45	28.30	29.50
0.75% max. C, 80-85% Mn, 5.0-7.0% Si	23.45	25.30	26.50

Silicomanganese

Contract basis, lump size, cents per pound of metal, 65-68% Mn, 18-20% Si, 1.5% max. C for 2% max. C, deduct 0.2¢ f.o.b. shipping point.

Carload bulk	11.20
Ton lots	12.65
Briquet contract basis carloads, bulk, delivered, per lb of briquet	12.70
Ton lots, packed	14.90

Silvery Iron (electric furnace)

Si 15.50 to 16.00 pct, f.o.b. Keokuk, Iowa, or Wenatchee, Wash., \$98.50 gross ton, freight allowed to normal trade area. Si 15.01 to 15.50 pct, f.o.b. Niagara Falls, N. Y., \$93.00.

Silicon Metal

Contract price, cents per pound contained Si, lump size, delivered, packed.

	Ton lots	Carloads
96.50% Si, 2% Fe	22.75	21.45
98% Si, 1% Fe	23.25	21.95

Silicon Briquets

Contract price, cents per pound of briquets, bulk, delivered, 40% Si, 2 lb Si briquets.

Carloads, bulk	6.75
Ton lots, packed	9.35

Electric Ferrosilicon

Contract price, cents per lb contained Si, lump, bulk, carloads, delivered.

50% Si	11.75	75% Si	15.40
65% Si	14.50	85% Si	17.10
	90% Si		18.50

Calcium Metal

Eastern zone contract prices, cents per pound of metal, delivered.

	Cast	Turnings	Distilled
Ton lots	\$2.05	\$2.95	\$3.75
Less ton lots	2.40	3.30	4.55

Ferravanadium

50-55% V contract, basis, delivered, per pound, contained V, carloads, packed.

Openhearth	3.10
Crucible	3.20
High speed steel (Primos)	3.30

Alsiifer, 20% Al, 40% Si, 40% Fe. Contract basis, f.o.b. Suspension Bridge, N. Y., per lb.

Carloads	10.65¢
Ton lots	11.80¢

Calcium molybdate, 43.6-46.6% f.o.b. Langeloth, Pa., per pound contained Mo.

	\$1.34
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Ferrocolumbium, 50-60%, 2 in. x D contract basis, delivered per pound contained Cb.

Ton lots	\$6.90
Less ton lots	6.95

Ferro-tantalum-columbium, 20% Ta, 40% Cb, 0.30% C, contract basis, del'd, ton lots, 2-in. x D per lb con't Cb plus Ta.

	\$4.65
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Ferrumolybdenum, 55-75%, 200-lb containers, f.o.b. Langeloth, Pa., per pound contained Mo.

	\$1.54
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Ferrophosphorus, electric, 23-26%, car lots, f.o.b. Sigio, Mt. Pleasant, Tenn., \$4.00 unitage, per gross ton.

	\$90.00
10 tons to less carload	\$110.00

Ferrotitanium, 40% regular grade, 0.10% C max., f.o.b. Niagara Falls, N. Y., and Bridgeville, Pa., freight allowed, ton lots, per lb contained Ti.

	\$1.35
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Ferrotitanium, 25% low carbon, 0.10% C max., f.o.b. Niagara Falls, N. Y., and Bridgeville, Pa., freight allowed, ton lots, per lb contained Ti.

	\$1.50
Less ton lots	\$1.55

Ferrotitanium, 15 to 18% high carbon, f.o.b. Niagara Falls, N. Y., freight allowed, carload, per net ton.

	\$177.00
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Ferrotungsten, 1/4 x down, packed, per pound contained W, ton lots, f.o.b.

	\$3.45
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Molybde oxide, briquets, per lb contained Mo, f.o.b. Langeloth, Pa.

	\$1.33
bags, f.o.b. Washington, Pa., Langeloth, Pa.	\$1.30

Simanal, 20% Si, 30% Mn, 20% Al, contract basis, f.o.b. Philo, Ohio, freight allowed, per lb.

Carload, bulk lump	15.50¢
Ton lots, packed lump	16.75¢
Less ton lots	15.55

Vanadium oxide, 86-89% V₂O₅, contract basis, per pound contained V₂O₅.

	\$1.32
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Zirconium contract basis, per lb of alloy

35-40%, f.o.b. freight allowed, carloads, packed	26.25¢
12-15%, del'd, lump, bulk-carloads	8.50¢

Boron Agents

Borasil, contract prices per lb of alloy del. f.o.b. Philo, Ohio, freight allowed, B, 3.14%, Si 40-45%, per lb contained B.

	\$5.25
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Bortam, f.o.b. Niagara Falls

Ton lots, per pound	45¢
Less ton lots, per pound	50¢

Corbortam, Ti 15-21%, B 1-2% Si 2-4%, Al 1-2%, C 4.5-7.5% f.o.b. Suspension Bridge, N. Y., freight allowed.

Ton lots per pound	10.00¢
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Ferroboreon, 17.50% min. B, 1.50% max. Si, 0.50% max. Al, 0.50% max. C, 1 in. x D, ton lots

	1.20
F.o.b. Wash., Pa.; 100 lb up	
10 to 14% B	.35
14 to 19% B	1.20
19% min. B	1.50

Grinal, f.o.b. Bridgeville, Pa. freight allowed, 100 lb and over

No. 1	\$1.00
No. 79	50¢

Manganese-Boron, 75.00% Mn, 15-20% B, 5% max. Si, 0.50% max. Al, 3.00% max. C, 2 in. x D, del'd.

Ton lots	\$1.40
Less ton lots	1.57

Nickel-Boron, 15-18% B, 1.00% max. Al, 1.50% max. Si, 0.50% max. C, 3.00% max. Fe, balance Ni, del'd less ton lots.

	\$2.05
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Silica, contract basis, delivered.

Ton lots	45.00¢
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or STEEL"

THE CLEARING HOUSE

News of Used and Rebuilt Machinery

Detroit Sales Pick Up . . . Used machinery business in the Detroit area is getting better than it was in the early part of the fall. Several auctions at plants here have increased the supply of punch presses and tool room equipment available. Most recent sales were held by Studebaker-Packard Corp., the old Hudson Motor Car Co., Murray Body Corp. and the Wilson Foundry at Pontiac, Mich. Offerings included everything from heavy presses to complete tool rooms and foundries.

Bidding at all four of the sales was extremely active, indicating the underlying strength in the market. The sales were well attended and the number of private bidders almost equalled the number of dealers on hand.

Most of the dealer bidding was done on machines for which orders had already been placed. Since the demand for good used presses and tool room equipment has always been strong here, the sales served to equalize it to some extent with the supply.

Who's Buying? . . . An increasing number of calls for tool room machinery are coming from small shops that have started to work on the 1957 automotive programs. The demand for presses is expected to increase as stamping firms pick up the programs from the tool and die companies.

Dealers in Detroit are optimistic about the outlook for business in 1956. Although substantial orders have been placed for new machine tools, some companies that cannot wait for delivery are turning to used equipment as the answer to their problems. In other cases, smaller shops simply cannot afford new machinery.

Price Is Factor . . . The price factor combined with the delivery time involved for new equipment is expected to keep the amount of

used business here at a high level at least through the first 6 months of next year.

In addition, the 1957 auto programs are just getting started here and indications are that they are to be the biggest ever undertaken by the industry.

How About Older Machines? . . . Meanwhile, it's the same old story for older lines of machines. Dealers occasionally get a call for an older lathe or shaper from a small shop just starting out in business. Otherwise, older equipment is stored for a short time and then scrapped.

For this reason, dealers hesitate to buy an old machine because it usually ends up on the scrap pile. When one is purchased it is for a specific purpose.

East Is Optimistic . . . In the Philadelphia area, some firms report there's a good, steady demand for both new and used drill presses, radial presses, and milling machines. One dealer estimates his sales of this type equipment are up 10 pct over third quarter. He expects sales to climb proportionately in first quarter next year.

Behind the upswing, he points out, is the general step up in smaller machine shop business in the area.

It's noted also that there has been some pickup in sales of older equipment such as lathes and shapers during the fourth quarter.

Some firms indicate there's a continuing market for die tryout presses and most agree that sales are up generally for most weights of double-crank presses.

In general, dealers say that late-type machine tools are hardest to come by. Among the tightest items on the list are heavier-ton open back inclinables.

THE CLEARING HOUSE

CONSIDER GOOD USED EQUIPMENT FIRST

ANGLE BENDING ROLLS

3 x 3 x 1/2" Buffalo No. 1
1 1/2" x 1 1/2" x 1/4" Niagara No. 3
SALES
\$1225-64 Logman, Charging Box 6x12x34. Pro-
ducer Size 125 to 150 lbs.
\$125-70 Gailand Henning, Volume of Box 145 cu.
7. Dole Size 500 to 800 lbs.

BENDING ROLLS

8" x 3/16" Bertach Initial Type
10" x 1/4" Bertach Initial Type
12" x 1/4" Miles Pyramid Type
18" x 1/4" Bertach Initial Type Bending Roll
18" x 1/4" Wickes Pyramid Type

BRACKS-LEAF TYPE

12" x 1/4" Drets & Krump
12" x 1/4" Drets & Krump, Motor Driven

BRACKS-PRESS TYPE

12" All Steel Press Brakes, 250 ton Capacity
12" x 5/16" Pacific Hydraulic, 200 ton

BROAD

Model VP-6-40-40 American Vertical Hydr. Broad.
Max Capacity 60 ton, Stroke 40", Motor Drive
BRACKS-OVERHEAD ELECTRIC TRAVELING
5 ton P&H 25" Span 230 Volt D.C.
5 ton Northern 30" Span 230 Volt D.C.
5 ton Cleveland 30" Span 230 Volt D.C.
7 1/2 ton P&H 45" Span 440/3/60 A.C.
18 ton Niles 50" Span 230 Volt D.C.
19 ton Milwaukee 80" Span 230 Volt D.C.
With 5 ton Auxiliary
10 ton P&H 50" Span 230 Volt D.C.
15 ton P&H 50" Span 230 Volt D.C.
20 ton P&H 60" Span 230 Volt D.C.
20 ton Toledo 70" Span 550/3/60 A.C.
20 ton Shaw 80" Span 230 Volt D.C.
130 ton Whiting 80" Span 230/3/60 A.C.
With 10 ton Auxiliary

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1" to 5" Amco, Ajax, National
1", 4", 5", National High Duty, Air Clutch

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5 ton Hercult Top Charge

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53" McKay 17 Rolls 3 1/2" Dia.
72" McKay 15 Rolls 4 1/2" Dia.

PRESSES-HYDRAULIC

300 ton United Steam Hydr. Forging Press
500 ton Baldwin Southwark, 12" Stroke 48" x 23"
Between Columns
800 ton Clearing, 48" Stroke, Bed Area 48" x 48"
1000 ton Lake Erie Double Acting, 48" Stroke, Bed
Area 72" x 146"

1257 ton Baldwin Southwark Forging Press, 30"

Stroke Main Ram, 54" x 41" Bed, Columns
2045 ton Birdboro, 4 Columns, 14" Stroke Platen
45" x 40" Daylite 47"

4000 ton B-L-H Hydr. Forging Press

PRESS-Straight Side
Clearing Model TF41500-200 Triple Acting, Strokes
40, 25, 14", Bed Area 100" x 500"

PUNCH & SHEAR COMBINATIONS

BLUEFO 23 Pels Universal Ironworker, Capacity
Punch 1 1/2 thru 1/2", Shear Angles 65x1/2"
2 1/4" Buffalo Universal Ironworker
BUPLE 27 Cleveland 36" Throat, Punch 1 1/2" thru 1"
Style W Cleveland Single End, 60" Throat, 513 Ton

ROLL-PLATE STRAIGHTENING

10" Hilco & Jones, six Rolls 14" Dia.

ROLLING MILLS

13" x 34" Garrison Single Stand Two High
16" x 24" Farrel P&H Two Stand Two High
18" x 24" United Single Stand Two High
30" x 26" Bonland Single Stand Two High
32" x 40" Lewis Three High

ROLLS-FORMING

8 Stand Rafter Tube Forming Machine, Spindle 1 1/2"

SHEAR-GATE

80" x 1/4" Pels

SHEAR-ANGLE

8 x 6 x 1/4" Hilco & Jones
6 x 8 x 1" Long & Allister Biso B

SHEAR-BAR

#4 H&J Guillotine, Capacity 3 1/2" Square, 4" Round

SHEARS-ROTARY

1/2" Kling #230, With Flanging Attachment
3/4" Quickwork Whiting #94A-NEW 1953

SHEARS-SQUARING

10" x 12 Ga. Niagara No. 501B
12" x 1/2" Loy & Newirth

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DIRECT CURRENT MOTORS

Qu.	H.P.	Make	Type	Volts	R.P.M.
2	3000	Whose.	Mill	525	800
8	1500	Whose.	Mill	825	600
1	1250	G.E.	MCP	600	350/700
4	800	Whose.	Encd.	525	600
4	700	Whose.	Mill	250	300/700
2	600	Al. Ch.	Mill	600	300/600
2	500	Whose.	Mill	250	325/710
1	450/250	Al. Ch.	Mill	375/250	250/1000
1	450	Whose.	SK	300	450/600
1	350	G.E.	CD-160	230	1150
1	200/250	El. Dy.	Ped. Hrg.	230	400/1200
1	200	Whose.	SK-210	230	400/800
1	180	G.E.	MVC	230	400
1	150	Whose.	SK-201	230	300/900
2	125	Whose.	SK-184	230	575/850
1	125	G.E.	MFC	230	400/600
1	100	El. Dy.	Na-S	230	450/1250
2	100	El. Dy.	30-S	230	475/950
1	80	Reliance	451-T	230	575/1150
2	50	Whose.	SK-121.5	230	600/2200
1	40	G.E.	CD-123	230	500/1000
1	40	Whose.	SK-140	230	500/1700
1	32 1/2	Whose.	SK-150	230	400/1200
1	25	Whose.	SK-93	230	1800
1	20	C. Wh.	D.P.H.B.	250	1150/2400
1	19	Whose.	SK-123	230	400/1200
1	15	G.E.	CD-85	230	875/2200
1	12 1/2	Whose.	SK-100L	230	500/1500
1	12	Reliance	155-T	230	400/1600
1	10	Whose.	SK-103	230	400/1600
1	10	Al. Ch.	R-123	230	300/1500
4	10	Whose.	SK-91	230	250/1000
1	7 1/2	G.E.	CD-75	230	600/2070
1	7 1/4	G.E.	CD-85	230	450/1350
4	5 7/8	Reliance	T.R.F.C.	230	337/1350

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Qu.	KW	Make	R.P.M.	D.C. Volts	A.C. Volts
1	2500	Whose.	720	400	4160/2300
2	1250	Whose.	720	400	2300
1	500	Cr. Wh.	720	600	2300/440
2	500	Whose.	1200	125/350	2300/440
1	400	Cr. Wh.	1200	125/250	2300/440
1	300	G.E.	1200	125	2300
2	200	G.E.	900	125/250	2300
1	150	G.E.	1200	250	2300
1	100	Whose.	900	250	2300
1	100	Cr. Wh.	1200	125	440/230
1	75	G.E.	1200	250	440/230
3	50	G.E.	1200	390	440/230

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11" 8" Shell Diam. Melting Rate 9 Ton Per Hour

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72" Hanehoff 3-spd. rotary surface, new 1940.
18" x 90" Landis gas type cylindrical, new 1941.
13" x 60" Model 300 Hanehoff vert. updl., late.

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1	800	G.E.	MT	2300	282
1	750	G.E.	MT-573	2200	1190
1	700	A.C.		2300	860
1	500	G.E.	MT-412	2300	860
1	500	Whose.	CW	550	350
1	500	G.E.	M-560Z	2300	1180
1	400	Whose.	CW-900A	440	1170
1	400	Whose.	CW	440	814
1	400	Whose.	CW-1213	2200	435
1	350	G.E.	MT-447Y	2200/4000	252
1	350	G.E.	MT-17A	440/2200	720
1	250	G.E.	MT-124Y	4000	257
1	250	G.E.	MT-550R	2200	1800
1	250	Al. Ch.		550	600
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1	200	G.E.	IM	2200	580
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2	125	A.C.		440	720
1	100	G.E.	IM-10	2300	435
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2	200	G.E.	IE-17	440	580
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1	150	Whose.	CR-850H	440	820
1	150	Whose.	CR	440	680
2	125	Al. Ch.	ARW	2200	1750
1	100	Whose.	CR-870C	440	710

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2	725	G.E.	ATT	2200/1200	600
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2	500	G.E.	TH-750T	2200	1200
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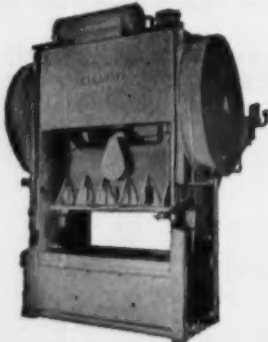
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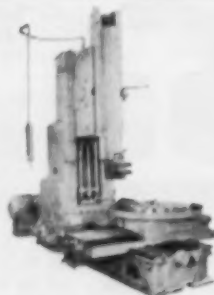
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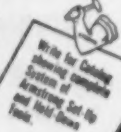
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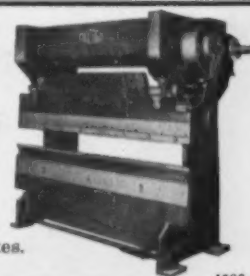
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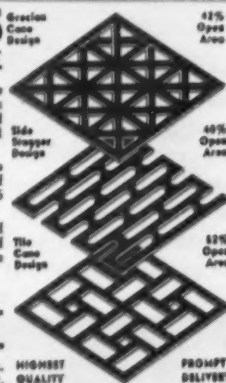
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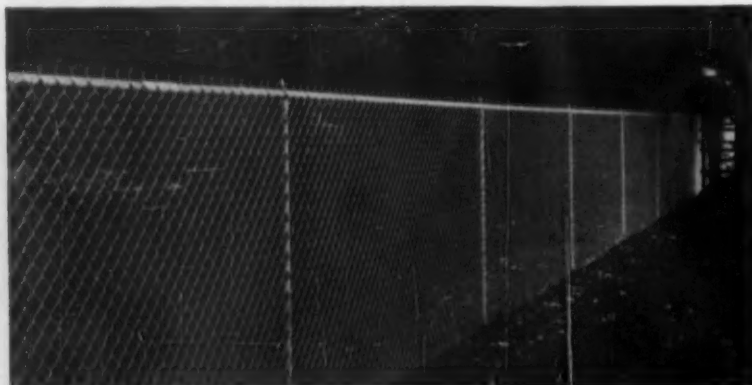
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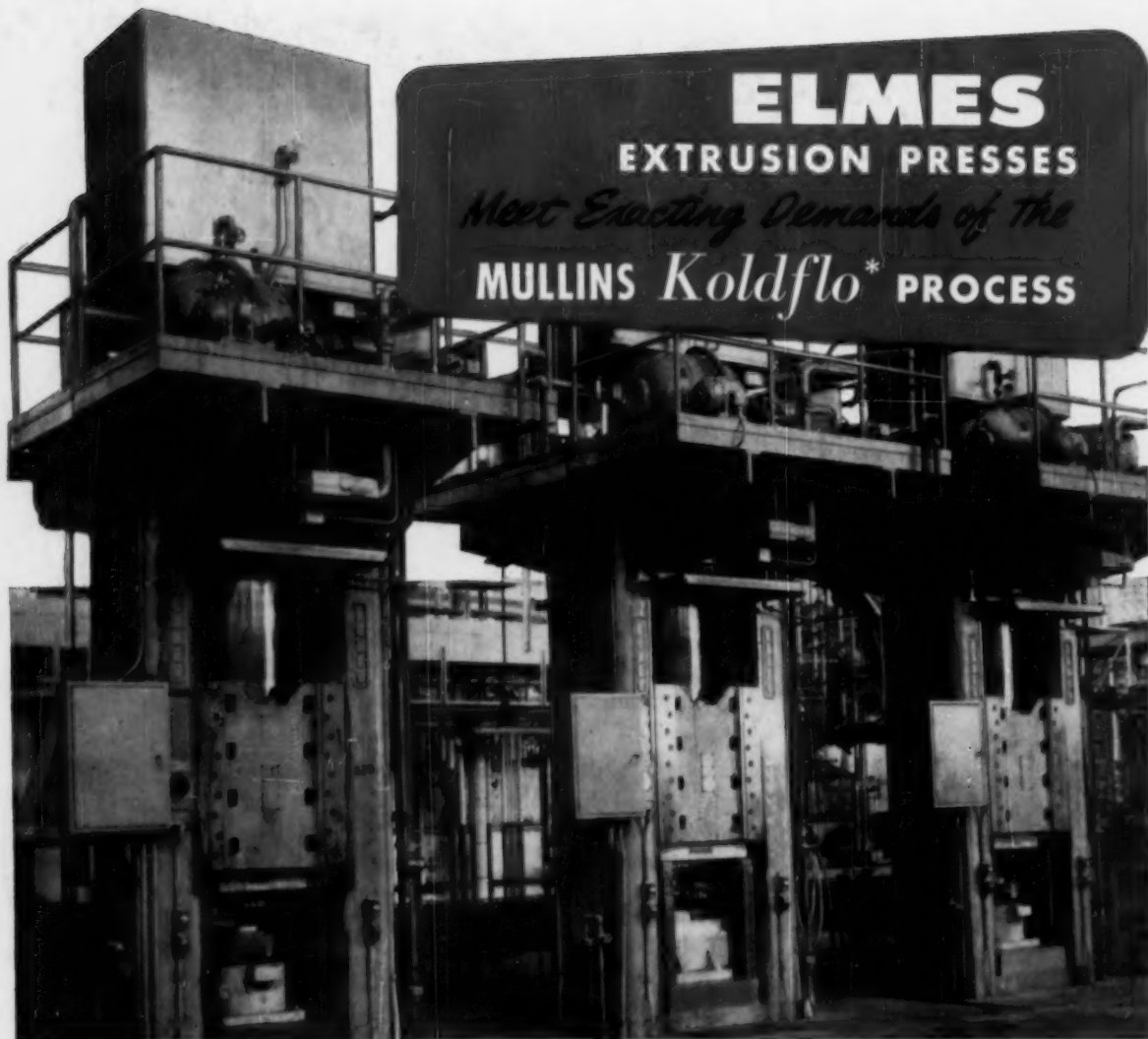
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